

FY 2008*October 1, 2007 – September 30, 2008*

**Performance Evaluation
of
Jefferson Science Associates, LLC**

**for the
Management and Operations of the
Thomas Jefferson National Accelerator Facility (TJNAF)**

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SUMMARY

The 2008 S&T Review Committee gave a strong endorsement of the Lab's scientific program during the closeout session and commented in the following areas:

- Research program "continues to be a world leader."
- The Theory Group has an "international impact."
- The Accelerator staff was praised as "highly professional."
- Lab's student programs were called "commendable."
- Applauded the Lab's "consistent and systematic" cryogenics program, noting its world leadership standing.
- Praised the Lab for its relations with users and providing a nurturing climate.

In addition, no new recommendations were made for the second consecutive year. This level of performance was delivered in the context of considerable financial uncertainty including an extended Continuing Resolution and one of the Lab's most significant budget shortfalls in the base program. Two major accomplishments stand out and were recognized in the S&T Review, namely the Lab's first article in *Science*, which sheds new light on a major question that has faced the field of nuclear structure for thirty years, and a cover article in *Physical Review Letters* highlighting the dramatic improvement in precision of key Standard Model parameters that was enabled by the Lab's world-leading measurements of parity-violating electron scattering.

With respect to the 12 GeV Upgrade Project, which is the Department's highest priority for the next decade, the S&T Review was also exceptionally positive:

"Clearly, you are doing very well, and I want to applaud you," said Dr. Jehanne Simon-Gillo, Acting Associate Director of DOE's Office of Science for Nuclear Physics.

The 12 GeV CEBAF Upgrade Project received both CD-2 and CD-3 Approval in FY2008 with excellent overall cost and schedule Performance Indices at Level 1, no reportable variances at Level 2, and steadily increasing contingency throughout FY2008. The project demonstrates strict adherence to DOE Order 413.3A with all critical decision prerequisites met at the time of the Independent Project Review. Dr. Jehanne Simon-Gillo congratulated the team for a successful 12 GeV CD-2 and CD-3, noting their "high standards of professionalism".



On the basis of these exceptional results we believe that the Lab has earned a grade of "A+" under Objectives 1.1 and 2.2 with an overall S&T score of 3.98 for an "A".

Some of the highlights in the M&O Goals 4 - 8 in FY08 include:

- JSA vision further refined to address key scientific, technical and infrastructure issues and ensure continued success of the Lab.
- Outstanding leadership in national and international nuclear physics communities.
- Outstanding management of FY08 budget and program priorities under challenging circumstances.

- Further improved JLab Insight to provide fully transparent information, data and reports to DOE and for effective management of the Lab.
- Intense and well managed search effort resulting in selection of outstanding replacement for retiring Lab Director.
- Efforts by JSA resulted in \$6M being appropriated by Virginia for 12 GeV Upgrade Project with clear path forward to utilize funding.
- Extremely successful year in safety with excellent DART and TRC rates. Outstanding results from HSS Review with 11 of 13 areas rated effective (green) and only two needing improvement (yellow).
- Annual Work Plan (AWP) facilitated timely identification of budget impacts on workscope and deliverables and allowed for prioritization to ensure critical work was budgeted under tight funding constraints. It also allowed for the funding of key activities that arose during the year, such as carving out \$600K in FY08 for TEDF preparation to leverage an opportunity and secure funding for this critical infrastructure project.
- Managed FY08 funding to ensure maintenance investment exceeded 2% goal. Protected carryover funds to adequately support PED efforts for TEDF resulting in attainment of CD-1 on schedule. Effectively managed funds to ensure progress for ACD in FY09 even under Continuing Resolution. Led efforts to design and implement a mission readiness approach to the management of site infrastructure.



TEDF

These exemplary results in Goals 4-8, particularly in light of a 3rd year under Continuing Resolution and nearly flat funding after inflation, support a score of 3.68 for a grade of “A-“ in the M&O area.

Table 1. FY 2008 JSA Evaluation Score Calculation

S&T Performance Goal	Numerical Score	Letter Grade	Weight	Weighted Score	Total Score
1.0 Mission Accomplishment	3.96	A	40%	1.58	
2.0 Construction and Operations of User Research Facilities and Equipment	4.03	A	40%	1.61	
3.0 Science and Technology Research Project/Program Management	3.94	A	20%	0.79	
Total Score					3.98
M&O Performance Goal	Numerical Score	Letter Grade	Weight	Weighted Score	Total Score
4.0 Leadership and Stewardship of the Laboratory	3.80	A	20%	0.76	
5.0 Integrated Safety, Health, and Environmental Protection	3.64	A-	30%	1.09	
6.0 Business Systems	3.65	A-	20%	0.73	
7.0 Operating, Maintaining, and Renewing Facility and Infrastructure Portfolio	3.74	A-	15%	0.56	
8.0 Integrated Safeguards and Security Management and Emergency Management Systems	3.58	A-	15%	0.54	
Total Score					3.68

Table 2. FY 2008 JSA Letter Grade Scale/Numeric Score Scale

Total Score	4.3-4.1	4.0-3.8	3.7-3.5	3.4-3.1	3.0-2.8	2.7-2.5	2.4-2.1	2.0-1.8	1.7-1.1	1.0-0.8	0.7-0
Final Grade	A+	A	A-	B+	B	B-	C+	C	C-	D	F

Table 3. Final Percentage of Performance-Based Fee Earned Determination

Overall Fee Determination	
Percent S&T Fee Earned from Table C	97%
M&O Fee Multiplier from Table C	X 100%
Overall Earned Percentage of Performance-Based Fee	97%

GOAL 1.0 PROVIDE FOR EFFICIENT AND EFFECTIVE MISSION ACCOMPLISHMENTGoal Requirement:

The Contractor produces high-quality, original, and creative results that advance science and technology; demonstrates sustained scientific progress and impact; receives appropriate external recognition of accomplishments; and contributes to overall research and development goals of the Department and its customers.

Objective 1.1 Science and Technology Results Provide Meaningful Impact on the FieldObjective Requirement:

In determining the performance of the Objective the DOE evaluator(s) shall consider the following as measured by progress reports, peer reviews, Field Work Proposals (FWPs), Program Office reviews/oversight, etc.:

- The impact of publications on the field;
- Publication in journals outside the field indicating broad impact;
- Impact on DOE or other customer mission(s);
- Successful stewardship of mission-relevant research areas;
- Significant awards (R&D 100, FLC, Nobel Prizes, etc.);
- Invited talks, citations, making high-quality data available to the scientific community; and
- Development of tools and techniques that become standards or widely-used in the scientific community.

Performance Level Achieved	Grade	Score
Changes the way the research community thinks about a particular field; resolves critical questions and thus moves research areas forward; results generate huge interest/enthusiasm in the field.	A+	4.1

JSA Performance:

The primary source of performance evaluation data for Goals 1 – 3 comes from the S&T Review which was held June 30 – July 2, 2008. The review committee commented that the JLab's research program continues to be a world leader in the study of hadron structure as evidenced by the presentation of precision data on spin structure functions, baryon spectroscopy and form factors. They also noted that the scientific accomplishments of the Laboratory over the past year are impressive, as evidenced by the presentation of precision data on spin structure functions, baryon spectroscopy and form factors. Listed below are some highlights from the final report:

RESEARCH PROGRAM:

- Two of last year's reported results have been finalized and published. The electron scattering from carbon indicating the dominance of proton-neutron short-range correlations over proton-proton or neutron-neutron correlations has been published in the journal Science. This is the Laboratory's first Science article. A global analysis of the up and down quark electroweak coupling constants from electron scattering has been published in Physical Review Letters (PRL), and the main result appeared on the September 2007 PRL cover.
- Preliminary measurements of the neutron electric form factor, G_E^n , are providing high precision data at high Q^2 that are consistent with but extending beyond the previous data parameterization by Galster.

- The so-called “European Muon Collaboration (EMC) effect”, observed in heavy nuclei, has been seen in ^3He based on recent measurements on ^3He and ^4He . These represent the most precise data in light nuclei to date. These data constitute another important step along the path to resolving the puzzle known as the EMC effect.
- The energy resolution of the High resolution Kaon Spectrometer (HKS) has surpassed its initial goal of 400 keV for hypernuclear energy levels.
- The Frozen Spin Target (FROST) target in Hall B has been commissioned and used in initial experiments, demonstrating with a high polarization of 85%. A first round photon beam experiment extending 31 days has been completed. Target polarization relaxation times of more than 1400 hours with beam on target have been achieved.
- Over the past year, the Program Advisory Committee (PAC) met twice, once to review nine 12 GeV proposals, of which five were approved and three conditionally approved. The second PAC met to evaluate the final 25 proposals for the 6 GeV program, of which ten were approved and eight conditionally approved.
- The backlog in the experimental schedule has been reduced to an average of 4 years, compared to 5 years as of last year. With this backlog, the 6 GeV program is expected to be completed by the time the accelerator is shut down within the context of planned operations.
- Recent results from the CLAS experiment on Cascade spectroscopy are providing valuable initial studies and training in preparation for the 12 GeV CLAS and Hall D GLUEX programs.
- The two large parity experiments, Qweak and Parity Radius Experiment (PREX), will place significant, new technical challenges on the operation of the CEBAF beam.

In addition to these S&T Review comments, Jefferson Lab continues to impact the scientific community by contributing to publications in journals outside the scientific field and developing tools and techniques that are standard and widely used in the scientific community. During FY08 JLab Staff and Users had a collective total of 243 publications which included 7 Theses, 33 Contributed Papers, 114 Invited Talks in conference proceedings, and 89 papers published in Other Refereed Journals. JLab Staff authored or co-authored several noteworthy feature articles including:

Study of Short-Range Correlations in Nuclei: precise studies of high momentum nucleon pairs knocked out of nuclei have resolved a long-standing controversy in nuclear structure as to whether missing spectroscopic strength was associated with Deltas in nuclei, the strong short-distance repulsion in the NN force or the tensor force. The tremendous enhancement of np over pp pairs strongly supports the idea that the tensor force is the dominant mechanism. This work was reported in *Science* in May 2008, the Laboratory’s first article in *Science*.

Testing the Standard Model by Precision Measurement of the Weak Charges of Quarks was highlighted on the cover of Physical Review Letters; this research, which was based upon the large quantity of high precision data on parity violating electron scattering from JLab, raised the lower limit on the mass scale of new forms of matter not predicted by the Standard Model of particle physics by more than a factor of two – to more than 0.9 TeV. For the future, with Qweak’s anticipated accuracy, one will improve the current limits on new forms of the weak force on up and down quarks by another factor of five. It could also raise the predicted mass for new particles another 1 TeV, which is above previous limits dominated by atomic parity violation (APV) data.

PET and Bioluminescent Imaging Aid Evaluation of Stem Cells’ Potential for New Ways to Treat Disease was highlighted in the Society of Nuclear Medicine (SNM) Advancing Molecular Imaging and Therapy. SNM is an international organization dedicated to promoting the science, technology and practical applications of molecular and nuclear imaging to diagnose, manage and treat diseases.

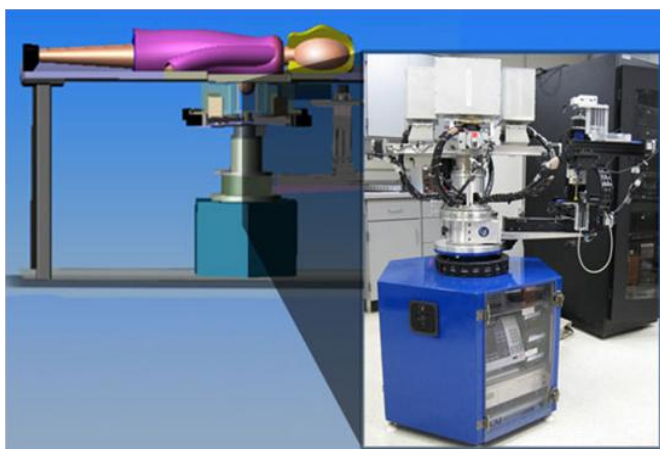
This magazine is the most prominent peer-reviewed journal in the field of nuclear medicine.

In an ongoing effort to remain in the forefront of the SRF R&D program, JLab continues to bid for all SRF or cryogenic R&D that aligns with the Lab's core competencies and will also bid for injector R&D. The Lab is the U.S. lead in electron gun R&D. Greater than 35% of the SRF operating experience in the world has been at CEBAF. The SRF Institute has fabricated and/or processed a wider variety of multi-cell SRF cavities than anyone else with a total of 608 to date (see chart below); 59 additional cavities were processed since the 2007 S&T Review was held. The 25 different cavity types include 9 different frequencies, 6 different beta values, and both CW and pulsed. In addition, a large number of single cell test cavities have been fabricated and/or processed. JLab contributed 14 posters, 22 proceedings papers, and 4 tutorials for the 2007 SRF Workshop that was held at Peking University October 14 – 19, 2007. This workshop was hosted by the Institution of Heavy Ion Physics and is the premier forum for technical advances in SRF. The Lab's high profile at this workshop is another indication of efforts to remain in the forefront. In recent developments, JLab and Niowave were awarded a Phase I SBIR to develop a $\beta=1$ multi-spoke superconducting cavity for electron linacs.

Project	# of Cavities built @ Jlab	# of Cavities processed / tested	Frequency (MHz)	Beta	# of Cells	Duty Factor
CEBAF (OC cell shape)	20	358	1497	1	5	CW
CEBAF (OC) - C50 rework		28+ 46	1497	1	5	CW
CEBAF Upgrade Style (OC)	8	8	1497	1	7	CW
CEBAF Upgrade Style (LL)	5	5	1497	1	7	CW
CEBAF Upgrade Style (HG)	9	9	1497	1	7	CW
C100 - (LL)	2	2	1497	1	7	CW
FEL IR DEMO (OC)	10	10	1497	1	5	CW
FEL 10 kW Upgrade (OC)	8	8	1497	1	7	CW
FEL HCCM (HC)	3	1	1497	1	5	CW
FEL HCCM (HC)	1		750	1	5	CW
AES HC Inj		3	750	1	1	CW
AES HC Inj		1	1500	1	1	CW
APT	2	2	700	0.64	3	CW
APT		3	700	0.64	5	CW
SNS	4	37	805	0.61	6	Pulsed
SNS	1	49+ 3	805	0.81	6	Pulsed
RIA	2	2	805	0.47	6	Pulsed
INFN Legnaro - seamless		1	1500	1	5	CW
INFN Milan - TRASCO		1	703	0.5	5	CW
DESY - seamless		3	1300	1	2	CW
KEK	1	1	1300	1	10	Pulsed
ILC-like - superstructure	1	1	1497	1	10	Pulsed
BNL		1	704	1	5	CW
FLASH - FNAL/DESY	5		3900	1	9	Pulsed
ILC - (TESLA)		6 + 3	1300	1	9	Pulsed
ILC - (LL)	1	1	1300	1	7	Pulsed
ILC - (Japan LL)		1	1300	1	9	Pulsed
ILC - (TESLA)	4	2	1300	1	9	Pulsed

The SRF Institute is also involved in many outside collaborations that enhance and benefit from the Lab's core competencies. A few examples are:

- JLab contributed a number of important cavity tests and completed the first regional exchange of the 9-cell cavity program, receiving a 9-cell prototype cavity from KEK in Japan and qualifying it to the ILC gradient specification. This was the first such demonstration for this alternative cavity type.
- Completed a cavity string assembly for an experimental 700 MHz cavity for Brookhaven National Laboratory. This cavity met all its performance goals in qualification and was the largest cavity ever processed at JLab.
- Qualified two five-cell high-current cavity prototypes of a new design suitable for a high-power FEL or fourth generation light source. Eventually hope to test these with beam in the existing JLab FEL.
- Completed and successfully tested a “crab” cavity prototype for ANL that provides a sideways kick to the beam bunches as opposed to the normal direction of acceleration. Such cavities would be required for ELIC.



Schematic drawing of PEM/PET imaging and biopsy system. Image: Ray Raylman

A medical imager built with the assistance of Jefferson Lab's Radiation Detector and Medical Imaging group has proven its mettle in initial tests. The positron emission mammography/tomography breast imaging and biopsy system (PEM/PET) was designed and constructed by scientists at JLab, West Virginia University, and the University of Maryland School of Medicine. The tests demonstrated that the imager is capable of spotting tumors that are half the size of the smallest detected by standard imaging systems. JLab's Radiation Detector and Medical Imaging Group leader notes that is “the most-important and most-difficult imager we’ve developed so far.” The results

of these tests were published in the journal *Physics in Medicine and Biology* on February 7, 2008. This technique has been cited on several websites and in various publications.

Collaboration between Theory Center staff and researchers from the Tokyo University of Science has for the first time developed a chiral version of the quark-meson coupling model. The new model is based on the volume coupling version of the cloudy bag model, in which the effects of the pion cloud and gluon exchange are included self-consistently. The model describes symmetric nuclear matter reasonably well and predicts a decrease of the axial coupling constant with increasing nuclear baryon density. This implies that the isoscalar, central nuclear force is weakened in medium- and heavy-mass nuclei. Another collaboration of theorists from JLab and Germany used the Color Glass Condensate (CGC) model to evaluate nuclear quark and gluon generalized parton distributions and the cross section of deeply virtual Compton scattering off heavy nuclear targets in the small Bjorken- x region. These predictions are relevant for the physics program of the future EIC and for ultra-peripheral nucleus-nucleus collisions at the Large Hadron Collider at CERN.

Research performed at JLab has found that protons are about 20 times more likely to pair up with neutrons than with other protons in the nucleus. The results, which were published online by the journal *Science* at the Science Express website, could have implications for understanding the structure of nuclear systems from light nuclei to neutron stars. This collaboration included more than 60 members from 31 national and international institutions and in addition to the U.S. Department of Energy, was also

supported by the U.S. National Science Foundation, the Israel Science Foundation, the US-Israeli Bi-national Scientific Foundation, the UK Engineering and Physical Sciences Research Council and the Science & Technology Facilities Council.

Objective 1.2 Provide Quality Leadership in Science and Technology

Objective Requirement:

In determining the performance of the Objective the DOE evaluator(s) shall consider the following as measured by progress reports, peer reviews, Program Office reviews/oversight, etc.:

- Willingness to pursue novel approaches and/or demonstration of innovative solutions to problems;
- Willingness to take on high-risk/high payoff/long-term research problems, evidence that the Contractor “guessed right” in that previous risky decisions proved to be correct and are paying off;
- The uniqueness and challenge of science pursued, recognition for doing the best work in the field;
- Extent of collaborative efforts, quality of the scientists attracted and maintained at the Laboratory;
- Staff members visible in leadership position in the scientific community; and
- Effectiveness in driving the direction and setting the priorities of the community in a research field.

Performance Level Achieved	Grade	Score
Laboratory staff lead Academy or equivalent panels; laboratory’s work changes the direction of research fields; world-class scientists are attracted to the laboratory, laboratory is trend setter in a field.	A	4.0

JSA Performance:

The S&T review committee acknowledged that the work of the Theory group has international impact, and provides strong leadership in a number of areas of nuclear physics, including hadronic structure, Lattice QCD, hadronic modeling, excited baryon coupled-channel analysis, and perturbative QCD. They also noted that JLab staff served on the International Advisory Committees for many conferences and have been involved in the planning of several meetings in FY08 (Division of Nuclear Physics (DNP) 2007, Lattice 2008, 4th EIC Workshop, Photon-Hadron Physics with the Glue X detector, DIS2008). Listed below are some highlights from the final report:

THEORY PROGRAM:

- The theory group continues to develop the science programs for the 12 GeV upgrade and a future EIC facility in addition to supporting the ongoing 6 GeV experimental program in key areas that include: studies of hadron structure [i.e. nucleon spin, generalized parton distributions, Deeply Virtual Compton Scattering (DVCS), structure functions and their large-x behavior, the role of two-photon exchange in the extraction of nucleon form factors, developments in the Anti-Desitter Space – Conformal Field theory (ADS/CFT) correspondence]; spectroscopy [the large- N_c limit of QCD, Excited Baryon Analysis Center (EBAC), Lattice QCD]; and the physics of the standard model and beyond.
- The LQCD group has a diverse physics program tied to the Laboratory’s experimental program. Recent efforts include studies of radiative transitions in charmonium decays, the nucleon axial charge, isovector nucleon form factors, quark helicity and orbital angular momentum, pion-pion and kaon-kaon scattering, the three-pion interaction, and the equation of state of a pion condensate.

- Diverse investigations of structure functions are illuminating aspects of global and local duality in the resonance region (truncated moments of F_2), and the large- x region. A dedicated effort is underway to utilize all of the Laboratory's data in a global analysis of parton distributions.
- The Laboratory's theory group was instrumental in establishing the framework for Generalized Parton Distribution Functions (GPDs), and continues to play a leading role in a world-wide effort to explore, understand and utilize them.
- The LQCD theorists are innovative and technically strong, and TJNAF is a world center for LQCD. They have shared lattice configurations and expertise with other collaborations. They originated "Chroma", a widely used LQCD code, which is a valuable resource for the nuclear and particle physics community. Presently, they are producing a challenging anisotropic lattice generation program that is important for nucleon structure work.
- The inclusion of two-photon exchange contributions in the extraction of nucleon form factors by Melnitchouk and his collaborators, illustrates the responsiveness of the theory group to important developments in the Laboratory's experimental program.
- The EBAC program continues to make good progress. The coupled-channels formalism has been extended to include double-pion photoproduction and channels with kaons and hyperons which are necessary to analyze the high-quality N^* data collected at JLab. The incorporation of (pseudoscalar) meson electroproduction data will include a large quantity of data with information on baryon resonances. It is necessary to compare results from this and the reviewers continue to stress the importance to develop other unitary coupled-channels approaches to estimate the model dependence of the results of this program for baryon properties. For this reason, collaboration between members of EBAC and the larger baryon resonance community is encouraged by the panel.

SCIENTIFIC AND TECHNICAL STAFF:

- The TJNAF employees and their students have received important awards in the past year, including American Physical Society (APS) fellow designations, a NASA Appreciation Award and patents.
- The staff participates in high level committees and boards, including advisory committees, project reviews, and conference organization boards. The Scientific Director chairs the International Conference on High-Energy Accelerators (IUPAP) Working Group on the international cooperation in Nuclear Physics.
- The high efficiency in machine and detector operations and prolific experimental results are impressive and indicate a highly professional and technically capable experimental staff. The Laboratory staff plays a major leadership role in many of the experiments themselves.
- The TJNAF scientific and technical staff has maintained a strong rate of publication in recent years.
- SRF and cryogenics staff is internationally recognized and playing leading roles in the developing of projects important to the Office of Science (SC) mission and abroad.

JLab staff has been highly visible in leadership positions in the scientific community. The Chief Scientist, Hall B Group Leader and a Hall A Staff Scientist are members of the International Advisory Committee for NSTAR 2009 – the Workshop on Physics of Excited Nucleon. This workshop is hosted by the Institute of High Energy Physics (IHEP) of Chinese Academy of Sciences (CAS) and will be held in Beijing, China April 19 – 22, 2009. The goal of the workshop is to bring upon expertise from both experiment and theory to focus on the physics of excited nucleon.

In addition, JLab's Chief Scientist chairs the new IUPAP Working Group on International Collaboration in Nuclear Physics. In that role he participated in the recent OECD Global Science Forum Working Group on Nuclear Physics. Created at the request of the United States, this group has prepared a report for

funding agencies which incorporates a global roadmap for nuclear physics as well as important recommendations for future international cooperation in this field.

JLab's Associate Director of Physics became the Chair-Elect of the APS Division of Nuclear Physics Executive Committee in April 2008. In addition, several JLab staff were selected as 2007 Fellows of the American Physical Society (APS). To put it in perspective, each year no more than one-half of one percent of the current membership of the Society is recognized by their peers for their major contributions to the field of nuclear physics and the physics of beams. The awards were presented at the DNP Spring Meeting in April 2008 and listed below are the staff members along with a brief summary of the contributions that were recognized.

- Bob Rimmer – nominated for advances in the science and technology of RF structures and beam stability in high-current accelerators.
- Winston Roberts – nominated for significant contributions to hadron physics using models of QCD as well as effective field theories and phenomenological Lagrangians, for the development of polarization observables in photoproduced three-body final states, and for continued service to the nuclear science community.
- Haiyan Gao – nominated for her extensive contributions to understanding the quark/hadron transition region and for determinations of the nucleon electromagnetic form factors.
- Edward Kinney – nominated for his contributions to the experimental study of the spin structure of the nucleon in polarized deep inelastic electron scattering from internal polarized gas targets and for his experimental and theoretical elucidation of pion reaction mechanisms in pion double charge exchange in light nuclei.
- Sebastian Kuhn – nominated for his leadership on measurements of the nucleon structure functions, in particular in the non-perturbative and valence region.
- Raju Venugopalan – nominated for seminal work elucidating the parton substructure of nucleons and nuclei at low x .

There was a discrepancy in the number of PhDs listed in the mid-year evaluation report. The actual number awarded in FY08 is 22; including 5 awarded to women.

Theorists at JLab, Argonne National Laboratory and Tokai University in Japan completed a sophisticated calculation of the nucleon's transversity quark distribution function, determining that the transversity and helicity distributions are similar in magnitude. If the experimental result persists, it will represent an important challenge to theoretical physicists at JLab and elsewhere. Theory Center staff has also for the first time in lattice QCD, computed certain weak nuclear couplings of the Sigma and Xi hyperons, which have not yet been measured experimentally. In addition, using the corresponding coupling of the nucleon, the effects of the breaking of "SU(3) flavor" symmetry, which relates the couplings of these baryons, has been estimated. The results indicate around a 20% symmetry breaking, with about 5% statistical and systematic errors.

The "Ganni Cycle", a process invented by JLab engineers, has saved Brookhaven National Laboratory approximately \$50,000 per week in electric costs for running the Relativistic Heavy Ion Collider (RHIC). The electricity needed to operate the system dropped from 9.2 MW in 2002 to 5 MW currently, saving BNL an estimated \$1.5M during the typical annual operating schedule for RHIC. The Ganni Cycle was a recipient of DOE's 2006 Best in Class Pollution Prevention and Environmental Stewardship Award and the 2007 White House Closing the Circle Award last year.

Objective 1.3 Provide and Sustain Outputs that Advance Program Objectives and Goals
Objective Requirement:

In determining the performance of the Objective the DOE evaluator(s) shall consider the following as measured through defined project products, progress reports, statements of work, program management plans, Program Office and/or other reviews/oversight, etc.:

- The quantity and quality of program/project (e.g., technical reports, policy papers, prototype demonstrations, tasks, etc.), output(s) be it policy, R&D, or implementation programs;
- The number of publications in peer-reviewed journals; and
- Demonstrated progress against peer reviewed recommendations, headquarters guidance, etc.

Performance Level Achieved	Grade	Score
Program offices, clients, end-users, independent experts and/or peers laud work results; output(s) exceeds the amount and/or quality typically expected for an excellent body of work.	A	3.8

JSA Performance:

The percent of anticipated data accumulated during FY08: Hall A = 110.3% of its planned experiment progress, corresponding to 3.2 billion events; Hall B = 91.8%, corresponding to 13.7 billion events; and Hall C = 101.8%, corresponding to 3.26 billion events.

Excited Baryon Analysis Center (EBAC) members are currently working on three projects that analyze the data of π and $\pi\pi$ production. In the first project, *Dynamical coupled-channel analysis at EBAC*, a dynamical coupled-channel model has been developed and is being applied at EBAC to analyze the data of π and $\pi\pi$ production, aiming at verifying and interpreting the $\gamma N \rightarrow N^*$ form factors for a number of known N^* states which are extracted recently by the CLAS collaboration and other empirical amplitude analysis groups. The model is an extension of a well-developed dynamical model in the Δ region to include higher mass N^* states and more reaction channels including the $\pi\pi N$ continuum. An extension of the analysis to include πN channel is being pursued, as a step toward performing a complete dynamical analysis with all reaction channels. This effort is also providing theoretical input to the data analyses by the experimental groups, especially by the CLAS collaboration at JLab. For the second project, *Analysis of CLAS data with Julich model*, the Julich coupled-channel model has been extended to analyze pion photoproduction data in the Δ region. As part of the effort at EBAC, this model is being refined to match with the chiral perturbation theory and Regge phenomenology. The electroproduction processes are to be calculated in the next stage. The third project, *EBAC-Saclay coupled-channel analysis of ηN and KY Photoproduction*, involves efforts being made by applying EBAC's coupled-channel code to perform a comprehensive analysis of all of available data of $\pi N \rightarrow \eta N$ and $\gamma N \rightarrow \eta N$ data. Progress is also being made to extend the work to include more reaction channels in extracting the N^* parameters from KY photoproduction data.

A fully relativistic calculation of the $D(e,e'p)n$ reaction in the impulse approximation has been performed using the SAID parametrization of the full NN scattering amplitude to describe the final state interactions (FSI) of the proton and neutron.

See write up in Objective 1.1 regarding performance in publications.

Objective 1.4 Provide for Effective Delivery of Products
Objective Requirement:

In determining the performance of the Objective the DOE evaluator(s) shall consider the following as measured by progress reports, peer reviews, Field Work Proposals (FWPs), Program Office reviews/oversight, etc.:

- Efficiency and effectiveness in meeting goals/milestones documented within FWPs and/or other such documents;
- Efficiency and effectiveness in delivering on promises and/or getting instruments to work as promised;
- Efficiency and effectiveness in transmitting results to the community and/or responding to DOE or other customer guidance.

Performance Level Achieved	Grade	Score
Program/project goals and/or milestones are met well ahead of schedule and/or well under budget; program/project and/or mission objective(s) are fully meet and results anticipate HQ guidance.	A	3.8

JSA Performance:

JLab's newest supercomputer was ranked on the TOP500 Supercomputer Sites list released in mid-November 2007, as the 95th fastest in the world and the fastest listed in the Commonwealth of Virginia. The 7N cluster computer is composed of 396 nodes containing 2 AMD quad-cores that are wired together to function as one. It has more than tripled the Lab's high-end computing capabilities since installation in addition to consuming about 20% less power than dual cores. This accomplishment put JLab on the map in the high-performance computing community.

On November 21, 2007 cavity AES2 reached an accelerating gradient of 32.6 MV/m following the 4th light EP of a 20 microns surface removal. This is the first high gradient achieved by a 9-cell ILC cavity manufactured by U.S. industry. The cavity performance is limited by quench instead of field emissions, demonstrating the continued success of JLab's high gradient capability in pushing high gradient, without limits by field emission. The Lab is currently on track to achieve an accelerating gradient of 35 MV/m.

An application of the Jefferson Lab's "floating pressure" control system (the portion of the Ganni Cycle which is applicable to existing plants) was made to two 3.5Kw, 20K helium refrigerators at NASA's Johnson Space Center in 1996. These 20K refrigerators are the same standard helium refrigerators used by the DOE laboratories for such applications as cryogenic target refrigeration. The results of the application showed substantial increase in thermal system stability (temperature regulation improvement from $\pm 2.5\text{K}$ to $\pm 0.25\text{K}$) as well as reduced utility use. NASA will be reporting the results of the conversion in a paper to be presented at the Space Simulation Conference 2008 to be held in September and the Cryogenics Operations Workshop 2008 to be held at CERN.

Jefferson Laboratory had developed a standard helium purification system which allows DOE laboratories to recover helium gas for reuse. With rising helium gas cost and availability issues, the system provides a mechanism for cost and operational availability control. FERMI, NASA, and industry (for commercialization) have expressed interest in the system. A "standard" warm helium compressor system design is also being developed that optimizes the compressor component performances while reducing the system cost. The system design is funded by NASA and has direct application to the compressors required for JLab's 12 GeV cryogenic system upgrade.

Recent techniques developed by the SRF-community to increase the accelerating field gradient within superconducting-RF cavities were applied to DC high voltage cathode electrode structures. Specifically, the technique of electropolishing and high pressure rinsing was used to significantly increase the

operating range of a cathode electrode from 5 MV/m to 15 MV/m. This increase in field gradient should allow an increase of the operating voltage of the JLab polarized electron gun well above 200kV, more than a factor of two increase in bias voltage. Such an increase would significantly improve transmission of the electron beam through the CEBAF photoinjector by reducing the ill-effects of space charge induced emittance growth and could help contribute to techniques that would improve the performance of still-higher voltage guns for energy recovered linacs, FELs and physics accelerators such as the ILC and EIC.

A new polarized electron source was installed at the CEBAF photoinjector. The new gun, termed a “load-locked gun”, is composed of multiple vacuum chambers separated by valves. New photocathodes can be loaded into the first vacuum chamber, processed, and moved to the high voltage chamber with best vacuum in just 12 hours, compared to previous gun designs that require days of baking at 250C to obtain acceptable vacuum following a photocathode swap. The load locked gun was commissioned prior to installation at CEBAF and demonstrated good performance with world-record high current beam delivery at 1mA from a high polarization photocathode. Commissioning at CEBAF is now underway. This new gun will contribute significantly to future high current experiments such as Qweak, helping to reduce accelerator downtime.

The Accelerator operated at a high rate of efficiency pre SAD → Halls A, B, and C divided 370 hours of beam delivery; highlights included periods of 100 microamp beam to Hall C and more than eight hours of Accelerator Operation beam test plans successfully accomplished.

Table 4. Goal 1.0 Performance Rating Development

ELEMENT	Letter Grade	Numerical Score	Objective Weight	Total Points	Total Points
1.0 Efficient and Effective Mission Accomplishment					
1.1 Impact	A+	4.1	35%	1.44	
1.2 Leadership	A	4.0	25%	1.00	
1.3 Output	A	3.8	25%	0.95	
1.4 Delivery	A	3.8	15%	0.57	
Performance Goal 1.0 Total					3.96

Table 5. Goal 1.0 Final Letter Grade

Total Score	4.3-4.1	4.0-3.8	3.7-3.5	3.4-3.1	3.0-2.8	2.7-2.5	2.4-2.1	2.0-1.8	1.7-1.1	1.0-0.8	0.7-0
Final Grade	A+	A	A-	B+	B	B-	C+	C	C-	D	F

Goal 2.0 Provide for Efficient and Effective Design, Fabrication, Construction and Operation of Facilities

Goal Requirement:

The Contractor provides effective and efficient strategic planning; fabrication, construction and/or operations of Laboratory research facilities; and is responsive to the user community.

Objective 2.1 Provide Effective Facility Design(s) as Required to Support Laboratory Programs (i.e., activities leading up to CD-2)
Objective Requirement:

In determining the performance of the Objective the DOE evaluator(s) shall consider the following as measured by scientific/technical workshops developing pre-conceptual R&D, progress reports, Lehman reviews, Program/Staff Office reviews/oversight, etc.:

- Effectiveness of planning of preconceptual R&D and design for life-cycle efficiency;
- Leverage of existing facilities at the site;
- Delivery of accurate and timely information needed to carry out the critical decision and budget formulation process.; and
- Ability to meet the intent of DOE Order 413.3A, Program and Project Management for the Acquisition of Capital Assets.

Performance Level Achieved	Grade	Score
N/A	N/A	N/A

Note: Objective 2.1 is not applicable to JLab in this performance period per the PEMP.

Objective 2.2 Provide for the Effective and Efficient Construction of Facilities and/or Fabrication of Components (execution phase, Post CD-2 to CD-4)
Objective Requirement:

In determining the performance of the Objective the DOE evaluator(s) shall consider the following as measured by progress reports, Lehman reviews, Program/Staff Office reviews/oversight, etc.:

- Adherence to DOE Order 413.3A Project Management for the Acquisition of Capital Assets;
- Successful fabrication of facility components;
- Effectiveness in meeting construction schedule and budget; and
- Quality of key staff overseeing the project(s).

Performance Level Achieved	Grade	Score
Laboratory has identified and implemented practices that would allow the project scope to be increased if such were desirable, without impact on baseline cost or schedule; Laboratory always provides exemplary project status reports on time to DOE and takes the initiative to communicate emerging problems or issues. There is high confidence throughout the execution phase that the project will meet its cost/schedule performance baseline; Reviews identify environment, safety and health practices to be exemplary.	A+	4.1

JSA Performance:

The primary source of performance evaluation data for this Objective comes from the DOE SC Independent Project Review convened by Mr. D. Lehman, Director of the Office of Project Assessment held for July 22 – 24, 2008. In addition, the S&T review committee noted that the apparatus development and beam studies are well matched to the requirements of the 12 GeV Upgrade and that JLab is currently the only laboratory within the NP program which has funding to actively pursue a major upgrade, defining a long term vision for the laboratory.

The project made excellent progress on both R&D and PED with excellent overall Performance Indices at Level 1 and no reportable variances at Level 2. As of September 2008, the R&D effort is 98% complete and the PED effort is 76% complete. Twenty-nine Advance Procurement Plans (APPs) for major procurements (>\$500K), including all for FY2009 procurements, have been approved and progress is being tracked weekly. Eighteen packages have been released for “sources sought” all of which have had replies.

The 12 GeV Project received approval of CD-2 on November 9, 2007. Dr. Jehanne Simon-Gillo congratulated the team for a successful 12 GeV CD-2, noting their “high standards of professionalism” throughout the multi-review process and ESAAB. The 12 GeV Project received approval of CD-3 on September 15, 2008.

The OECM Earned Value Management System (EVMS) Contractor Certification review took place the week of December 3, 2007 where the 12 GeV Upgrade project provided the principal material used to demonstrate the validity of the JSA/JLab EVMS and compliance with the ANSI/EIA-748 EVMS guidelines. Following a follow-up implementation review in August 2008, JSA received the EVMS Certification the week of September 15, 2008.

CIVIL:

The design effort on conventional facilities to support the 12 GeV CEBAF Upgrade is complete thus meeting a level 2 project milestone. Drawings, specifications, and construction cost estimates were developed for eight (8) construction subcontracts to be placed during the next four years. Three were completed by contracted Architect-Engineer (A-E) design firms – CHL Building Addition, CHL Utility Upgrades, and Hall D Complex. Five projects to upgrade the Accelerator infrastructure were completed by in-house JLab Facilities & Logistics personnel. The CHL projects modify the existing Central Helium Liquefier Plant with a building addition and new utilities to support operation of CHL #2. The solicitation (Request for Proposal) for the CHL Building Addition was issued on September 30, 2008.

Hall D Complex is the new conventional facilities to house the Hall D experimental equipment including the beam transport line and the utilities to support operations of Experimental Hall D. The internal design and safety review meeting with over 35 participants was held on November 14 & 15, 2007.

North and South Access Building Additions add square footage to two (2) existing buildings to house the upgraded LCW system and magnet power supplies. The internal design and safety review meeting was held on December 17, 2007.

Beam Switchyard (BSY) Service Building Addition is an internal addition in Building 98 that expands the power supply room into the welding area and includes two new penetrations into the accelerator tunnel. The 100% package was distributed on January 18, 2008 for an internal design and safety review, and a meeting to discuss the review findings was held on February 13, 2008.

North and South Access Building Utility Upgrades expands Low Conductivity Water (LCW) systems for Linac service buildings and ARC magnets and adds electrical substations to increase power capacity at each building. The 100% design package was distributed on March 10, 2008 for an internal design and safety review and a meeting to discuss the comments with the Design Team was held on April 22, 2008.

North and South Linac Power Upgrade provides a new 1.5 MVA electrical unit substation and switchboard at each Linac service building to provide power for new RF zones. The 100% design package was distributed on June 6, 2008 for an internal design and safety review and a meeting to discuss the comments with the Design Team was held on July 1, 2008.

Tunnel Air Conditioning provides air cooling to the tunnel east and west arcs to ensure established conditions in tunnel after magnet power has been secured. The 100% design package was distributed on August 4, 2008 for an internal design and safety review and a meeting to discuss the comments with the Design Team was held on August 19, 2008.

The solicitation (Request for Proposal) for civil construction of the Hall D Complex was issued on May 23, 2008. This is a best value procurement which evaluates the vendors' capability in addition to price as part of the selection process. The pre-bid conference and site visit, attended by over 35 contractor personnel, was held on July 21, 2008. Closing date for Phase II Technical Proposals and Offer was August 19, 2008. The Technical Evaluation Committee completed assessment of the Offerors' capability on September 12, 2008 and discussions were initiated on September 29, 2008.

In support of an application to the Commonwealth of Virginia for a permit to discharge groundwater from the excavation dewatering operations, a subcontract was awarded to an environmental consultant to perform groundwater sampling in the planned excavation areas of the Hall D construction site.

ACCELERATOR:

The 12 GeV Accelerator Team continues to make good progress on Project Engineering and Design (PED). Design status and safety reviews, including reviewers external to the design effort, were held for all accelerator subsystems in 2008 resulting in very few recommendations and an overall endorsement of the maturity of the designs and procurement plans. The Power System underwent two design status and safety reviews; RF and Magnet Power systems were reviewed separately. The review panel for the Cryomodules subsystem found that the team had responded appropriately to the recent beam-breakup problems seen with the Renaissance cryomodule during beam operations.

A review was held of the proposed procurement strategy for beamline magnets, and a decision was made to shift from JLab buying the materials and supplying them to the magnet vendors to one which has the vendors buy the materials; the new plan yields more schedule flexibility with no technical risk and roughly the same cost risk as the previous baseline plan.

The higher-order mode damping was re-validated for the cavity design being used for the 12 GeV Upgrade through measurement. An additional quality control process was tested and validated to ensure that no cavities are assembled into cryomodules that potentially do not meet the damping specification.

The Beam Transport team completed the measurements on the prototype beamline quadrupole magnets and identified final design changes.

A vertically-integrated test of the Low Level Radio Frequency (LLRF) controls with the self-excited-loop software was performed successfully. The test included the latest versions of the digital board, RF board, and PC/104 IOC-replacement with all operating in concert.

RFPs have been released for the 4.5 Kelvin Coldbox, klystrons, 4m arc dipoles, beamline quadrupoles and SRF cavity contracts. These represent over 35% of the total contract value of all planned procurements for Accelerator Systems for the duration of the Project.

PHYSICS – Experimental Equipment:

The 12 GeV Physics Team continues to make good progress on Project Engineering and Design (PED). Design and safety reviews, predominantly consisting of external review committee members, were held for most of the physics subsystems in 2008 including: Hall C detector integration, Hall D Forward Drift

Chamber, Hall D Central Drift Chamber, Hall D tracking and particle identification system, Hall B Silicon Vertex Tracker, Hall B Central Time-of-Flight detector, Halls B and C superconducting magnets, Hall C support structure and shield house, and a Halls B and D systems review including electronics and infrastructure. JLab staff and user collaborations were commended on their work in advancing the various designs. Many review committees had no further recommendations. Responses to all recommendations from these reviews are tracked and were reported to the DOE Independent Project Review committee.

Significant progress was made with the R&D effort on both detectors and magnets with completion of the 2008 tasks including:

- Hall B: preshower calorimeter, beamline design optimization, forward drift chamber mechanical and electrical studies, CTOF light guides, and SVT read-out;
- Hall C: horizontal bend magnet mechanical studies and trial winding of coils, quality assurance testing and location optimization of lead glass calorimeter modules; and
- Hall D: barrel calorimeter fiber tests, tagger prototype, flash ADC prototype of master trigger, auxiliary electronics prototype (global 250MHz clock distribution), and forward/central drift chamber prototypes.

Solicitations were issued for the Hall D Barrel Calorimeter scintillating fibers, with proposals recently received, and the first of the new superconducting magnets, the SHMS/Q1 magnet for Hall C. External contributions to the 12 GeV Upgrade project were obtained both through two approved Major Research Instrumentation grants of the US National Science Foundation, and the receipt of the HERMES calorimeter blocks, as a gift to the project through NIKHEF/Netherlands and Yerevan/Armenia. Hall D hosted a workshop in early March 2008 to discuss additional ideas for science with the GlueX detector with more than 60 attendees.

PROJECT MANAGEMENT:

At the request of the Office of Nuclear Physics, Daniel Lehman, Director of the Office of Project Assessment in the DOE Office of Science, led a team of 24 experts in an Independent Project Review of the 12 GeV Upgrade at JLab on July 22-24, 2008. The purpose of the review was to assess all aspects of the project “technical, cost, schedule, management and ES&H” with regard to satisfying the requirements for Critical Decision-3, Approve Start of Construction. The review team concluded that the project meets all requirements and endorsed approval of CD-3. The DOE Office of Engineering Construction Management (OECM) held its follow-up review of implementation of the JSA/JLab EVMS system on August 12-13, 2008 resulting in certification of the EVMS system the week of September 15, 2008. The project received CD-3 approval from the Acquisition Executive, Dr. R. Orbach, on September 15, 2008.

"Today's approval is truly historic," said Dr. Jehanne Simon-Gillo, Acting Associate Director of DOE's Office of Science for Nuclear Physics. "The 12 GeV CEBAF upgrade will enable scientists to seek answers to some of Nature's most perplexing questions, expand our knowledge of the universe and benefit people around the world. The project also clearly demonstrates our Nation's commitment to remaining in the forefront of scientific exploration and discovery."

TJSO 3rd Quarter Feedback → *The 12 GeV Upgrade Project Team performed at an exemplary level through this review period. Throughout the performance period the Project maintained overall Project Cost Performance Index and Schedule Performance Index indices well within allowable ranges. Numerous design reviews, which also included evaluating ES&H considerations in the designs, were conducted in support of readiness for the upcoming Office of Science Independent Project Review and CD-3 approval by the Acquisition Executive. All necessary Project documentation (e.g., updated Project*

Execution Plan, preliminary Safety Assessment Document, Interface Control Documents, Advance Procurement Plans, Construction Safety and Health Plan, updated Risk Registry) are on-track for being completed in support of the SC IPR and CD-3 approval. Management of the Advance Procurement Plans are also on-track in preparation for the start of construction in FY 2009. All Project reporting (e.g., monthly reports, PARS input, Quarterly Project Progress Reports) was performed in a timely manner with good quality information. Lastly, the Project Contingency and Management Reserve funds were effectively and prudently managed.

Opportunity for Improvement:

- TJSO 1st Quarter Feedback → *There does not seem to be any evidence that indicates that the 12 GeV Experimental Equipment Advisory Committee or the 12 GeV Accelerator Advisory Committee are being effectively utilized by Jefferson Lab.*

Status: The first meeting of the two committees has been scheduled for November 4-6, 2008 and will take the form of a Director's Project Review. Several committee members are being added to review management aspects of the project as well as the accelerator and experimental equipment scope.

Objective 2.3 Provide Efficient and Effective Operation of Facilities

Objective Requirement:

In determining the performance of the Objective the DOE evaluator(s) shall consider the following as measured by progress reports, peer reviews, Program/Staff Office reviews/oversight, performance against benchmarks, Approved Financial Plans (AFPs), etc.:

- Availability, reliability, and efficiency of facility(ies);
- Degree the facility is optimally arranged to support community;
- Whether R&D is conducted to develop/expand the capabilities of the facility(ies);
- Effectiveness in balancing resources between facility R&D and user support; and
- Quality of the process used to allocate facility time to users.

Performance Level Achieved	Grade	Score
Performance of the facility exceeds expectations as defined before the start of the year in any of these categories: cost of operations, users served, availability, beam delivery, or luminosity, and this performance can be directly attributed to the efforts of the laboratory; and /or: the schedule and the costs associated with the ramp-up to steady state operations are less than planned and are acknowledged to be 'leadership caliber' by reviews; Data on ES&H continues to be exemplary and widely regarded as among the 'best in class'.	A	4.0

JSA Performance:

As noted below, the S&T review committee acknowledged that the CEBAF operation is highly professional and efficient and well supported by CASA and the SRF Institute. Other national laboratories have benefited greatly from JLab's expertise in superconducting RF, cryogenic operation, energy recovery linacs and free electron lasers. They commented that CEBAF operation in FY08 has exceeded all goals that were set; in particular the reliability reached 92%, with an average multiplicity of 2.8 for beams delivery to the three target halls. The committee noted that the Cryogenics group is pursuing a consistent and systematic program to optimize the cryogenics plant which is critical to cryogenic engineering for current and future applications. They also acknowledged that the User community plays a

critical role in carrying out the research program of JLab. Listed below are some highlights from the final report:

OPERATIONS:

- The CEBAF operation is highly professional and efficient, and well supported by the Center for Advanced Studies of Accelerators CASA and the Superconducting Radio Frequency (SRF) Institute. A good example of a combined effort in solving an operational problem is the beam break-up instability observed after the installation of the Renaissance module that limited the available beam current. The source of the instability was located in that module, mitigation was devised through a lattice modification, and the cavity in question analyzed, finally tracking down the problem to a cavity weld that lead to a two orders of magnitude increase in the cavity Q value after tuning. Users seem very content with the operation.
- With good connections to several universities and joint appointments, the laboratory has access to a large pool of students. The efforts of training students in accelerator science and related technologies are commendable since they are valuable not only to the laboratory but to the field as a whole.
- Other national laboratories have benefited greatly from TJNAF's expertise in superconducting radio frequency, cryogenic operation, energy recovery linacs and free electron lasers.
- The 1.1 MW Energy Recovering Linac driving a 14 kW Free Electron Laser (FEL) is a world-class facility that has also been used as a test bed for components used in CEBAF upgrades.

CRYOGENICS:

- The group is a world leader in the development of cryogenic engineering. The collaboration work was widely recognized for very impressive results. Work for Others opportunities gave the cryogenic group the opportunity to explore technical issues and apply them to the 12 GeV CEBAF Upgrade. Cryogenic operational support and availability is outstanding and the control system upgrade is important for the future.
- The group has helped other national labs and agencies to implement the “Ganni cycle” procedure into existing cryoplants; improving efficiency and reducing operation costs. The group has developed the split cold box design model for the 12 GeV cryoplant that can lead to reduction in facility cost and requirements.
- The collaborative work of this group so far has benefited the Relativistic Heavy Ion Collider (RHIC) and the NASA James Webb Telescope project. NASA engineers in collaboration with TJNAF implemented floating pressure control changes to the existing 20K cryoplant leading to a 10-fold increase in the system temperature stability and a ~20% estimated reduction in future refrigerator cost for NASA. Also, an improvement in the nitrogen cooling of the Space Simulation Chamber resulted in a considerable savings in the operation cost for NASA. This effort also will benefit the 12 GeV CEBAF upgrade.
- The group is conducting R&D on warm compressor systems to increase efficiency and to standardize design and requirements of equipment. Cryogenics R&D projects are used for graduate work involving students from local universities.
- Availability of cryogenic systems for the accelerator, target and test facility at TJNAF is very high. The group is upgrading the control system and replacing the purification system of the cryoplant.

SCIENTIFIC USER COMMUNITY:

- Approximately 1,000 users from 200 institutions and 30 countries are on site each year. The JLab user community is involved with Jefferson Science Associates (JSA) activities, especially, the JSA Initiatives Fund. The Laboratory and JSA support initiatives for junior students.

- Users have voiced concerns about completion of the 6 GeV program, including a smooth continuation of the experimental program which is important to maintain a community of PhD students. They also have expressed concerns about having an easily accessible data archive, needed changes to the web feedback page, and the user friendliness of the Laboratory's website.
- The User Community plays a critical role in carrying out the research program of JLab. Overall, the Laboratory interactions with the users seem appropriate and they provide the proper environment for the users to accomplish their work.
- With 100 users on site each day, the reviewers thought that the Laboratory constitutes an excellent place for communication and a meeting place for researchers all over the world. The users seem generally very content with the responsiveness of the laboratory management.

The Cryogenics Department was recognized by NASA Johnson Space Center for their “outstanding work and technical competence” analyzing the plans for an upgraded cryogenics system for the space chamber. JLab staff proposed several alternatives – including the Ganni Cycle – which will potentially save NASA several million dollars in addition to reducing operation and maintenance costs. JLab is also designing a new refrigeration plant for NASA to be used in testing components of the next space telescope. NASA adopted the liquid nitrogen thermo-siphon distribution system technology developed at JLab for 2K cold compressors to use in testing the James Webb Telescope at the Johnson Space Center. Use of this technology saved NASA multi-million dollars of capital equipment cost and reduces the amount of maintenance and repair costs. The Johnson Space Center Director gave special recognition to JLab's cryogenic engineering staff in helping the center followed by award plaques presented to the staff by the Crew and Thermal Division deputy chief, Bruce Sausser. This new plant will triple the capacity of the current refrigeration system and is likely to be the first built using the Ganni Cycle.

To ensure the User community is kept fully informed, they were notified in February 2008 about upcoming PAC meetings and the procedures that will be followed for future 12 GeV PACS. The meetings will be held annually instead of semi-annually between now and approximately three years before first beam from the 12 GeV Upgrade. Users were provided a summary of the upcoming meetings; the next one is scheduled for January 2009 instead of summer 2008 to avoid conflict with preparations for CD-3. Users were also notified that the running schedule originally planned to start late in July has been moved to early October to minimize the impact on the collaborations with experiments that have been tentatively planned to start after the summer down. A link has been established on the JLab User pages so that they can contact the UGBOD directly – anonymously if they wish – with any concerns or issues that they feel should be addressed. Other examples of improved communications are the new quarterly meetings being set up between management and user representatives from each Hall, plus the Users Group Board Chair. The user representatives are collaboration or steering committee chairs or 12 GeV representatives.

The Electron Ion Collider (EIC) has been evaluated by NSAC and is the third priority after the CEBAF 12 GeV Upgrade Project and the RHIC Cooling Project. Accelerator design studies of ELIC, an Electron-Ion Collider at CEBAF, spearheaded by CASA, have progressed further, and resulted in a consistent set of parameters that meet the required performance goals. Accelerator physics issues continue to be investigated and quantified. Recent ELIC accelerator design highlights include → Optimization of the interaction region design, which includes the design of a Lambertson-style final focus quadrupole magnet; Beam optics designs of both the electron and ion storage rings; Improvements on the conceptual designs of the circulator ring-based electron cooler and fast kickers; Development of the concept for stacking and pre-cooling of the ion beam with stochastic cooling; and Begin numerical simulations of beam-beam effects. Further progress was also done on the ELIC Zeroth-Order Design Report. This is the first detailed document outlining the physics reach of ELIC and summarizing the accelerator design and R&D required to demonstrate the technical feasibility of ELIC. Other options for on-site facilities that have been evaluated include the Positron option CEBAF and the FEL User Facility.

JLab supported ILC cavity development work by providing its SRF expertise and specialized processing facilities to a team of international collaborators that are testing Japan's ICHIRO 5 cavity. On November 27, 2007, the first 20 microns EP of ICHIRO5 was successfully done, demonstrating the capability of JLab's EP machine for processing the Ichiro cavity which has a smaller aperture than a TTF cavity. The field flatness was tuned following EP and another light EP is planned to remove possible contaminants introduced during tuning operation. The performance goal for this cavity design is 51 MV/m. KEK built and handled the first stages of processing the cavity and JLab completed the cavity's processing and is now testing the component.

Final DOE Metrics for FY08:

Status as of 24:00: Tuesday, September 30, 2008	Congressional Budget	SC Official Updated Goals and Guidelines	Actual to Date
Delivered Research Hours		3,054	3,298
Delivered Beam Studies Hours		254	257
Delivered Tuning / Restore Hours		170	359
Total Delivered	-	-	3,914
Expected Delivered Hours	4,705	3,478	-
Total / Budgeted	-	-	113%
Unscheduled Failures		< 474	341
Scheduled Hours		3,952	4,255
Research / Scheduled		77%	78%
Reliability		> 88%	92%
Weeks of Operation	34.17	24.10	25.33

Objective 2.4 Utilization of Facility to Grow and Support Lab's Research Base and External User Community

Objective Requirement:

In determining the performance of the Objective the DOE evaluator(s) shall consider the following as measured by peer reviews, participation in international design teams, Program/Staff Office reviews/oversight, etc.:

- The facility is being used to perform influential science;
- Contractor's efforts to take full advantage of the facility to strengthen the Laboratory's research base;
- Conversely the facility is strengthened by a resident research community that pushes the envelope of what the facility can do and/or are among the scientific leaders of the community;
- Contractor's ability to appropriately balance access by internal and external user communities; and

- There is a healthy program of outreach to the scientific community.

Performance Level Achieved	Grade	Score
Reviews document that multiple disciplines are using the facility in new and novel ways, that the facility is being used to pursue influential science, that full advantage has been taken of the facility to enhance external user access, and strengthen the laboratory's research base. A healthy outreach program is in place.	A	4.0

JSA Performance:

The S&T review committee commented that the Laboratory's efforts seem to be distributed appropriately among various major tasks and with the 12 GeV program, followed by the 6 GeV program, having the highest priorities, the fractional effort on tasks not directly attributable to the upgrade does not seem excessive to the panel. They also noted that many of the other projects include risk regarding stable funding, and, should their funding source disappear, this could impact the nuclear physics program in order to retain critical staff. Additional highlights from this section of the report are listed below.

FUTURE FACILITY UPGRADES:

- The Laboratory is planning for a number of facility upgrades. These include near-term developments that improve the capabilities and operations of the 6 GeV program, the 12 GeV CEBAF Upgrade of the current facility and in the much longer term, an Electron Ion Collider. In addition, the Laboratory is also planning to participate in a number of other projects outside of Nuclear Physics which are of high importance to the mission of the Office of Science.
- Numerous tasks in addition to the 12 GeV CEBAF Upgrade, categorized as Work for Others, were reported. These include high Q, high gradient and Continuous Wave (CW) SRF efforts; FEL studies associated with the Infra-Red (IR) program winding down and being replaced by the Ultra-Violet (UV) program, and with substantial consultation on high power applications. Also there are numerous collaborations, for example with National Aeronautics Space Administration (NASA), Office of Naval Research (ONR), Brookhaven National Laboratory (BNL), Fermi National Accelerator Laboratory (FNAL), Japan-USA, the Oak Ridge National Laboratory (ORNL) Spallation Neutron Source (SNS) facility, and the Argonne National Laboratory (ANL) Advanced Photon Source (APS).
- Studies of future facilities are under consideration. These include EIC, 4th generation light source, high current recirculating ERL, seeded FEL, International Linear Collider (ILC), and high average current SRF. An EIC workshop, organized jointly by JLab and BNL, was held at Hampton University in May 2008 and a number of important technical advances were reported. BNL and JLab have also created a joint advisory committee for the EIC project.
- Most resources that contribute only indirectly to the 12 GeV Upgrade represent valuable national assets. These include core competencies in cryogenics and SRF that are of global importance.

Due to the Appropriations Budget, scheduled weeks of operation were reduced to 24 but the actual weeks of operation were 25.33. This allowed nine highly rated experiments to be completed and six highly rated experiments to be partially completed during this fiscal year. Brief summaries of the experiments conducted during this performance reporting period are listed below.

HALL A:

- *E05-110 Precision Measurement on Longitudinal and Transverse Response Functions of Quasi-Elastic Scattering in the Momentum Transfer Range $0.55\text{GeV}/c \leq |q| \leq 0.9\text{GeV}/c$* → This experiment aims to confirm or refute previous experimental results, and more importantly, to reach a range of momentum transfer (resolution) much extended and a precision much enhanced than previously achieved.
- *E06-007 - Impulse Approximation limitations to the $(e,e'p)$ on ^{208}Pb , identifying correlations and relativistic effects in the nuclear medium* → This measurement determined the TL asymmetry, A_{TL} , for protons emitted forward of the three momentum transfer \mathbf{q} and backward of \mathbf{q} as a function of missing momentum, p_{miss} for the reaction $^{208}\text{Pb}(e,e'p)^{207}\text{Tl}$.
- *E08-007: Precision The Proton Form Factor Ratio at Low Q^2* → This experiment performed a high precision measurement of the proton electromagnetic form factor ratio $\mu p \text{ GE/GM}$ in the Q^2 -range between 0.015 and 0.70 GeV^2 . Two different independent methods were used – the double spin asymmetry technique for $Q^2 = 0.015 - 0.40 \text{ GeV}^2$ (the low- Q^2 range), and the recoil-polarization technique $Q^2 = 0.25 - 0.70 \text{ GeV}^2$ (the high- Q^2 range).

HALL B:

- *g9-FROST Run Period* → For Hall B, it is usual to combine several experiments that are compatible in their experimental conditions and run them simultaneously → g9 includes five experiments that have a common physics goal: "baryon spectroscopy," the study of the excitation of protons and neutrons (baryons).
- *E04-005 Search for New Forms of Hadronic Matter in Photoproduction* → This experiment searched for new forms of matter utilizing a photon beam at CLAS in Hall B. Motivated by experimental results for gluonic hybrid meson candidates and from theoretical Lattice QCD and Flux-tube model calculations, Photoproduction provided an ideal hunting ground for gluonic matter.
- *E04-017 Study of Pentaquark States in Photoproduction of Protons* → This experiment conducted a systematic, high statistics study of the O^+ (1540) using the CLAS detector and the energy-tagged photon beam in Hall B. By increasing the sensitivity over previous experiments in CLAS, a more comprehensive understanding of the pentaquark phenomena may be obtained.
- *E08-003 Single Charged Pion Photoproduction* → This experiment obtained the ratio of the electric magnetic form factors of the proton, GEP and GMP, by measuring the transverse and longitudinal components of the polarization of the recoiling proton in ep → ep .

HALL C:

- *E04-108 Measurement of $G_E p = G_M p$ to $Q^2 = 9 \text{ GeV}^2$ via recoil polarization and E04-019: Measurement of the Two-Photon Exchange Contribution in ep Elastic Scattering Using Recoil Polarization.* → Experiment E04-108 in Hall C is the third of a series of investigations of the structure of the proton at smaller and smaller distances. E04-019 will run interlaced with E04-108 and is designed to help identify the source of the discrepancy.
- *E04-108: Measurement of $G_E p = G_M p$ to $Q^2 = 9 \text{ GeV}^2$ via recoil polarization and E04-019: Measurement of the Two-Photon Exchange Contribution in ep Elastic Scattering Using Recoil Polarization.* → Data taking was successfully completed in Hall C. The experiment captured data at

the highest momentum transfers for which the polarization transfer method of measuring proton form factors has been applied.

PAC-33 was held January 14th – 19th and the committee reviewed 25 proposals and one Letter of Intent. A through assessment of the submissions resulted in 10 proposals being approved, nine conditionally approved, and seven deferred. The large number of exceptional quality 6 GeV physics proposals is indicative of the great interest in the 6 GeV program. Beam time available for the experiments is 45 days each for Halls A and B and 35 days for Hall C. There is also time available in each Hall corresponding to the jeopardy experiments. The PAC Chair noted that Halls A, B, and C have made significant progress toward determining the basic structure of the proton, neutron and nuclei. The overall JLab program continued to show steady growth; prior to PAC 31 it included 173 approved experiments. To date, 138 full experiments have been completed at JLab. Twenty-seven papers have been published in Physical Review Letters or Physics Letters during the past calendar year, in addition to over 72 papers published in other refereed journals. The number of Ph.D. projects completed to date at JLab is 324, with an additional 224 projects in progress. The Chair also commented that Hall leaders, staff and users are to be commended for keeping the physics program and technical developments on track, especially given the budget situation.

Table 6. Goal 2.0 Performance Rating Development

ELEMENT	Letter Grade	Numerical Score	Objective Weight	Total Points	Total Points
2.0 Provide for Efficient and Effective Design, Fabrication, Construction and Operation of Facilities					
2.1 Provide Effective Facility Design(s)	N/A	N/A	0%	N/A	
2.2 Provide for the Effective and Efficient Construction of Facilities and/or Fabrication of Components	A+	4.1	25%	1.03	
2.3 Provide Efficient and Effective Operation of Facilities	A	4.0	60%	2.40	
2.4 Utilization of Facility to Grow and Support the Laboratory's Research Base and External User Community	A	4.0	15%	0.60	
Performance Goal 2.0 Total					4.03

Table 7. Goal 2.0 Final Letter Grade

Total Score	4.3-4.1	4.0-3.8	3.7-3.5	3.4-3.1	3.0-2.8	2.7-2.5	2.4-2.1	2.0-1.8	1.7-1.1	1.0-0.8	0.7-0
Final Grade	A+	A	A-	B+	B	B-	C+	C	C-	D	F

Goal 3.0 Provide Effective and Efficient Science and Technology Program Management

Goal Requirement:

The Contractor provides effective program vision and leadership; strategic planning and development of initiatives; recruits and retains a quality scientific workforce; and provides outstanding research processes, which improve research productivity.

Objective 3.1 Provide Effective and Efficient Stewardship of Scientific Capabilities and Program Vision
Objective Requirement:

In determining the performance of the Objective the DOE evaluator(s) shall consider the following as measured by peer reviews, existence and quality of strategic plans as determined by SC and scientific community review, Program Office reviews/oversight, etc.:

- Efficiency and Effectiveness of joint planning (e.g., workshops) with outside community;
- Articulation of scientific vision;
- Development of core competencies, ideas for new facilities and research programs; and
- Ability to attract and retain highly qualified staff.

Performance Level Achieved	Grade	Score
Providing strong programmatic vision that extends past the laboratory and for which the laboratory is a recognized leader within SC and in the broader research communities; development and maintenance of outstanding core competencies, including achieving superior scientific excellence in both exploratory, high-risk research and research that is vital to the DOE/SC missions; attraction and retention of world-leading scientists; recognition within the community as a world leader in the field.	A	4.0

JSA Performance:

As previously noted, the primary source of performance evaluation data for this Objective comes from the S&T Review that was held June 30 – July 2, 2008.

Celia Whitlatch, a mechanical engineer at JLab, was recognized at the October 12, 2007 Hispanic Engineer National Achievement Awards Conference (HENAAC) as one of the nation's "best and brightest" engineers → one of two honorees named in the civil engineering category. There were a total of 24 awardees overall.

Some examples of joint planning and workshops with the outside community during this performance period include:

- JLab and the Spallation Neutron Source (SNS) at Oak Ridge National Laboratory jointly hosted the International Conference on Accelerator and Large Experimental Physics Control Systems (ICALPECS) in Knoxville, Tennessee October 15 – 19, 2007.
- JLab hosted the SRC 2007 Workshop on "Short-range structure of nuclei at 12 GeV" October 26 – 28, 2007; the organizing committee included the University of Perugia, Ghent University, FIU, ODU, and PSU.
- The 1st CLAS12 RICH Detector Workshop was held at JLab January 28 – 29, 2008 to promote the construction of a RICH detector for CLAS12. The workshop focused on the identification of a solid and exciting physics program to promote and justify the construction of the detector. Organizers, in addition to JLab, included representatives from Argonne National Laboratory and the University of Connecticut.
- JLab is currently organizing the 4th Electron Ion Collider Workshop to be held at Hampton University May 19 – 23, 2008. Stony Brook/RBRC, MIT, and BNL are members of the organizing committee.
- JLab staff actively participated as members of the 2007 International Scientific Advisory Committee and the 2007 Program Committee and a JLAB staff member was the Program Committee Chair.

JLab has provided valuable expertise and technical assistance to the SNS facility at ORNL which recently established a new record as the world's most powerful accelerator based source of neutrons for scientific research; the beams will eventually produce up to 10 times more neutrons than any existing pulsed neutron source.

In the FEL, all sextupoles were installed in the beamline and staff members verified proper operation of the gun test stand sulfur hexafluoride (SF₆) safety valve. The Gun Test stand was brought into operation and generated high charge beams. Also, a UV beamline installation was 90% completed and is expected to be ready to allow beam transport in calendar 2008 with low power lasing to soon follow.

Objective 3.2 Provide Effective and Efficient Science and Technology Project/Program Planning and Management

Objective Requirement:

In determining the performance of the Objective the DOE evaluator(s) shall consider the following as measured by peer reviews, existence and quality of strategic plans as determined by SC and scientific community review, Program Office and scientific community review/oversight, etc.:

- Quality of R&D and/or user facility strategic plans;
- Adequacy in considering technical risks;
- Success in identifying/avoiding technical problems;
- Effectiveness in leveraging (synergy with) other areas of research; and
- Demonstration of willingness to make tough decisions (i.e., cut programs with sub-critical mass of expertise, divert resources to more promising areas, etc.).

Performance Level Achieved	Grade	Score
Research plans are proactive, not reactive, as evidenced by making hard decisions and taking strong actions; plans are robust against budget fluctuations – multiple contingencies planned for; new initiatives are proposed and funded through reallocation of resources from less effective programs; plans are updated regularly to reflect changing scientific and fiscal conditions; plans include ways to reduce risk, duration of programs.	A	3.9

JSA Performance:

The S&T review committee commented that the Laboratory has been successful over the years in recruiting high level scientific staff that have acquired a high visibility in the international community. They also noted that in a difficult time of searching for new leadership under constrained budgets, the laboratory management has done an excellent job. Listed below are additional comments and significant findings.

MANAGEMENT:

- Dr. Hugh Montgomery became JSA President and Director of TJNAF on September 2, 2008. With that decision, continuity of leadership has been assured.
- Facing severe budget cuts, the highest priority of the management has been to assure necessary resources for the highest priority projects, namely, keeping the 12 GeV Upgrade on schedule to receive CD-3 approval in 2008, and meeting DOE operational performance goals for the ongoing 6 GeV project.
- The JSA management implemented a new organizational structure that resulted in reorganizing the engineering and technical staff into a separate group to increase flexibility and efficiency in

operations. The planning for infrastructure modernization is under way and includes the construction of the Technology and Engineering Development Facility and renovating Building 58 (the test laboratory), funded by DOE Scientific Laboratory Infrastructure.

- JLab has a comprehensive educational program that includes science training of high school, undergraduate and graduate students, and teachers.
- The priorities in allocating the available resources and scheduling experiments for the last 3 years before shutdown appear to be appropriate.

JLab has reached an understanding with the ATLAS Group at ANL to be a partner in responding to the FOA for FRIB. JLab would be responsible for the high-energy part of the superconducting linac, including cryomodules and 2K refrigeration, as well as LLRF, couplers, tuners and controls for the whole linac. The Lab is also seeking to collaborate with MSU on their proposal. Other current collaborations include 4 GLS at Daresbury (design, wigglers, magnets, commissioning); Cornell (ERL technologies, source); ILC (SRF, source); RHIC (cryogenics, ERL for electron cooling); and SNS (cryogenics, SRF).

In addition, the Lab sponsored an Electron-Ion Collider Collaboration Meeting May 19th – 23rd at Hampton University. This was the fourth workshop in a series of workshops dedicated to broaden and refine the scientific exploration of the emerging QCD frontier that can be addressed with an EIC, and to continue work on design points for both the accelerator and the detectors. JLab is actively seeking collaborations with other facilities on the SNS Upgrade (SRF); Project X (SRF, cryogenic); and the Synchrotron Light Sources (APS, ALS).

JLab submitted a proposal to BES for \$1.12M to construct, test and install a new high current, high gradient cryounit in the FEL injector; this is a three year program with a total estimated cost of \$3.5M. Congress added \$2M for continued research in laser technology at JLab to the annual defense appropriations bill signed on November 13, 2007 by President Bush. In addition, JLab submitted a proposal for two JTO white paper submissions → Optimization of FEL Efficiency (\$360K FY08) and Ring Resonator Studies (\$177K FY08). Funding was granted for both.

A high power CO₂ laser for nanotube work funded by NASA was been commissioned and the 16T superconducting solenoid magnet for THz work funded by FSU was delivered to the FEL.

JLab sponsored the ECT 2008 workshop (Nuclear Medium Effects on the Quark and Gluon Structure of Hadrons) that was held in Trento, Italy June 3rd – 7th.

Objective 3.3 Provide Efficient and Effective Communications & Responsiveness to Customer Needs

Objective Requirement:

In determining the performance of the Objective the DOE evaluator(s) shall consider the following as measured by Program Office reviews/oversight, etc.:

- The quality, accuracy and timeliness of response to customer requests for information;
- The extent to which the Contractor keeps the customer informed of both positive and negative events at the Laboratory so that the customer can deal effectively with both internal and external constituencies; and
- The ease of determining the appropriate contact (who is on-point for what).

Performance Level Achieved	Grade	Score
Communication channels are well-defined and information is effectively conveyed; important or critical information is delivered in real time; responses to HQ requests for information from laboratory representatives are prompt, thorough, correct and succinct; laboratory representatives <i>always</i> initiate a communication with HQ on emerging issues.	A	3.9

JSA Performance:

JLab Scientific Leaders provided a comprehensive briefing on all aspects of Lab operations to Users on October 11, 2007 for an evening session DNP meeting. At the User Group Board Meeting held December 11, 2007, the Lab Director also provided important updates on the Director's search, the 12 GeV Upgrade, and the impact of operating under Continuing Resolution. In addition, he congratulated the User Group for outstanding experimental results, steady progress on the 12 GeV Upgrade, and excellent reviews from DOE – noting that the quality of proposals submitted were impressive.

The Lab Director meets with DOE's AD for Nuclear Physics on a monthly basis to discuss Lab priorities and ongoing program activities. This ongoing exchange keeps both parties informed about matters of mutual interest and aligned in addressing institutional and funding challenges. JLab has also been very responsive to DOE data calls as demonstrated in numerous examples throughout this report.

The Annual Users Workshop was held June 16th – 18th and included presentations from the User Group Board, Lab management, and funding agencies. Discussions included ongoing budgetary issues, scheduling the final years of the 6 GeV era, computing, etc. The meeting plays a central role in maintaining the coherence and effectiveness of the user community.

FY08 Challenge:

- FY07 DOE Evaluation Report → *The User community is concerned that delays in some of the 6 GeV programs caused by investments in the 12 GeV program will negatively impact the 6 GeV program and the graduate students dependent on 6 GeV experiments.*

Status: There have been extensive discussions with members of the community – including the Chair of the UGBOD and spokespersons of at least five key experiments. In addition, the Director issued an email on the budget to all staff and users at the end of January.

Table 8. Goal 3.0 Performance Rating Development

ELEMENT	Letter Grade	Numerical Score	Objective Weight	Total Points	Total Points
3.0 Provide Effective and Efficient Science and Technology Program Management					
3.1 Effective and Efficient Stewardship	A	4.0	40%	1.60	
3.2 Project/Program Planning and Management	A	3.9	40%	1.56	
3.3 Communications and Responsiveness	A	3.9	20%	0.78	
Performance Goal 3.0 Total					3.94

Table 9. Goal 3.0 Final Letter Grade

Total Score	4.3-4.1	4.0-3.8	3.7-3.5	3.4-3.1	3.0-2.8	2.7-2.5	2.4-2.1	2.0-1.8	1.7-1.1	1.0-0.8	0.7-0
Final Grade	A+	A	A-	B+	B	B-	C+	C	C-	D	F

Goal 4.0 Provide Sound and Competent Leadership and Stewardship of the Laboratory
Goal Requirement:

The Contractor's Leadership effectively provides direction in strategic planning to meet the mission and vision of the overall Laboratory; is accountable and responsive to specific issues and needs when required; and corporate office leadership provides appropriate levels of resources and support necessary for the overall success of the Laboratory.

Note: Within Goal 4, the use of "JSA" refers to the laboratory management while the terms "JSA Board" and "Corporate Owners" refer to the corporate entities of SURA and CSC.

TJJO 3rd Quarter Feedback → *The laboratory management continues to do an excellent job in managing the available resources to ensure that the science mission is not compromised at the TJNAF. Initial comments from the DOE Office of Independent Oversight during this reporting period indicate that ES&H is managed well. This is due in part to the commitment of Senior Lab leadership's commitment to ensuring that Integrated Safety Management is effective understood and applied to all employees at TJNAF.*

Objective 4.1 Provide a Distinctive Vision for the Laboratory and an Effective Plan for Accomplishment of the Vision to Include Strong Partnerships Required to Carry Out those Plans
Objective Requirement:

In measuring the performance of this Objective the DOE evaluator(s) shall consider the following:

- Quality of the Vision developed for the Laboratory and effectiveness in identifying its distinctive characteristics;
- Quality of Strategic/Work Plan for achieving the approved Laboratory vision;
- Quality of required Laboratory Business Plan;
- Ability to establish and maintain long-term partnerships/relationships that advance/expand ongoing Laboratory missions and/or provide new opportunities/capabilities; and
- Effectiveness in developing and implementing commercial research and development opportunities that leverage accomplishment of DOE goals and projects with other federal agencies that advance the utilization of Laboratory technologies and capabilities

Measure 4.1.1 Requirement: JSA's vision (20-year outlook) for the Laboratory addresses outstanding science questions of national priority to DOE. The vision informs and is aligned with that of the DOE Office of Science's and the NSAC long range plan. JSA monitors and reviews regularly its vision to ensure that critical elements (effective leadership, quality workforce, proper planning, outstanding research and operational processes, new initiative development) are in place to achieve the vision and to adapt to changes in plans that maximize the benefit to the Office of Science.

TARGET: JSA's strategic vision is appropriately developed with and reviewed by the JSA Board

annually to ensure credibility and relevance and to ensure that it optimally advances DOE's scientific agenda. JSA provides advice on an effective relations strategy that supports the vision and promotes leadership from the user community to communicate the vision.

JSA Performance:

As part of its commitment to ensure that the Lab's strategic vision is appropriate and optimally advances DOE's scientific agenda, the corporate owner continues to provide two relations firms, one for federal relations, one for state relations, as well as the dedicated efforts of its Relations Director, and members of the JSA Board as needed, to support, influence, and advance DOE's science agenda. The JSA Board notes that the organization's relations and outreach program supports the vision of the Lab and the Office of Science. The program encompasses a long-term strategy, first established by the predecessor contractor, and being carried forward by the JSA owners and corporate staff. This program provides for the continuous relations building necessary for securing and sustaining local, state, and federal support for the Lab mission. The beneficial results of these relationships with key decision makers do not necessarily accrue within a given performance period, but rather occur over a period of time. The President's FY2009 budget request is a 28.8% increase over current year. JSA relations efforts continue to support the Administration's budget request, which incorporates the JLab budget, by publicly and actively pursuing the case for adequate long-term funding for basic science. Additionally, and to adapt to changes brought about by the severely curtailed FY2008 budgets in the Office of Science, the JSA relations strategy included the active support for the FY2008 supplemental appropriations bill that helped to minimize some of the agency-wide impacts (lay-off's, furloughs, decreased facility run-time, economic decline), thus benefiting programs within the Office of Science. The specific relations activities that exemplify the building of an effective relations strategy are addressed in 4.3.3, along with the results of the program.

JLab management worked proactively to ensure the Lab continued to perform at high levels during the first quarter of FY08 when significant budget constraints were imposed by a continuing resolution. When the FY08 Appropriations Budget was received, the Lab was required to perform detailed analysis to mitigate negative impacts and risks associated with receiving a budget with a \$9M budget shortfall while, at the same time, producing quality science in a safe working environment.

Other examples of effective JSA leadership in support of the long range vision include: 1) Several reviews have been conducted for FEL (MTAC, JSA Science Council, etc.) that are helping to shape our vision and strategy; 2) A preliminary discussion was held with the City of Newport News to secure local support regarding plans to extend site boundaries for potential future expansion in support of the DOE mission; 3) The comprehensive vision and strategy presented to DOE NP in February was approved; 4) Members of Lab leadership are making significant contributions to the National Laboratory Director's Council (NLDC) through active participation in the COO working group, SLCC (JLab's CIO is Chair), and the CRO group (Lab Chief Scientists); 5) Lab leadership worked cooperatively with DOE NP and the national science community to keep regional and national decision-makers aware of JLab's contributions to the DOE science mission; 6) The Jefferson Lab Director briefed the OMB science budget examiner; and 7) The comprehensive strategy developed for the modernization of JLab over the next ten years received support from ONP – JSA is awaiting results of recent request from SC for additional SLI funding.

The Virginia Governor and Virginia's newly elected U. S. Congressional Representative, Rob Wittman, visited the Lab during FY08. JSA also made visits to key members of the Governor's Cabinet and Administration, and State legislators to increase awareness of Jefferson Lab's mission and the benefits to the Commonwealth. Building these relationships has helped garner support for the Governor's initiative to provide \$6M for the 12 GeV Upgrade in the second year of the Commonwealth's biennial budget despite a very difficult fiscal outlook for VA.

Measure 4.1.2 Requirement: The Business Plan (5-year) establishes the management agenda and identifies the opportunities, risks and required resources needed to realize Laboratory goals. The business plan sets the framework to optimize scientific output in a cost effective manner. Integrally, JSA develops a 5 year budget plan as a mechanism by which the Laboratory can ensure its goals are met.

TARGET: JSA works actively with DOE to update the 5-year Business Plan within the established timelines. JSA engages with customers/stakeholders and appropriate outside experts to ensure its 5-year Business Plan, budget plan and site plan are realistic. JSA oversees the development of and monitors the Plan to ensure that Laboratory operations and systems foster program effectiveness.

JSA Performance:

JLab's 5-year Business Plan was submitted to DOE on October 18, 2007 and, as requested by DOE, minor revisions were submitted on November 1, 2007. The 5-Year Business Plan, along with the 10 Year Facilities Site Plan, was integrated in 2008 by the Office of Science to provide a comprehensive document that identifies science initiatives and supporting infrastructure requirements. This new document is referred to as the 10 Year Strategic Plan. JLab received guidance for developing this new comprehensive plan in February 2008 and met all SC requests for information on schedule; the final draft of the plan was submitted to DOE on April 21, 2008. JLab also participated in ongoing SC conference calls with other SC labs to clarify and address requirements in the new plan. This document was the basis for a strategic planning meeting that was held with Undersecretary Orbach and other SC management on April 30, 2008. With feedback from this meeting the Lab's final Business Plan was submitted to DOE on May 30, 2008.

Measure 4.1.3 Requirement: The Laboratory has formalized vital collaborations and understandings within and among institutions in academe, users of the Laboratory, other national laboratories, and private sector entities for advancing priority issues in science, scientific workforce, and applications of science and technology.

TARGET: As a user facility, JSA optimizes opportunities to develop and promote effective collaborations such as formal scientific collaborations with other organizations to advance priority issues in science. JSA ensures a world-class scientific staff and associated personnel, including collaborations such as joint and bridged faculty appointments, graduate fellowship programs, and sabbatical programs, all of which contribute to furthering the science priority issues. JSA ensures inclusion of Laboratory initiatives in the NSAC Long Range Plan through active participation on its NSAC subcommittee. JSA monitors the Laboratory's technology transfer and commercialization initiatives, leveraging opportunities to advance Laboratory technologies and capabilities.

JSA Performance:

Through the JSA Initiatives Fund, the JSA Programs Committee awarded eight graduate fellowships for the 2008-2009 academic year to students at SURA member universities. The fellowships supported six proposals in experimental nuclear physics research, one proposal in nuclear physics theory, and one proposal in accelerator physics. The topics and areas of the research proposals include: the production and spectroscopy of exotic mesons, thin-film superconducting radio frequency accelerating cavities, parton distributions at high energy limit, measurement of Q^P_{weak} , K^{*0} photoproduction off the deuteron, more studies to better understand the resonance structures and search for "missing" resonances, exploration of the small components of ^3He ground state wave function, and better understanding of the structure of the neutron, particularly in the resonance region. Research proposals are directly related to approved JLab experiments (one in Hall A; 4 in Hall B; 1 in Hall C). As the sole single purpose nuclear

physics lab in the DOE laboratory system, it is incumbent upon JSA to enhance the research capability of outstanding students in the field. This fellowship program, supported by the Lab contractor for over twenty years, significantly contributes to the education, training and development of the next generation of scientists. See also additional information under 4.3.3.

Through the JSA Initiatives Fund, the JSA Programs Committee awarded sabbatical support to two faculty members who will be conducting research on JLab approved experiments during their sabbatical leaves from their home institutions. This year's awardees are faculty members at Florida State University and Florida International University (a Minority Serving Institution), both of whom will receive monetary support to offset the cost of their relocation to the JLab vicinity while conducting their research. The FSU faculty member is the spokesperson and lead contact for the CLAS g12 run group (Hall B). The FIU faculty member is one of the spokespersons for the E05-115 experiment aimed at a hyper-nuclear spectroscopy (Hall C). The support provided to these individuals will allow them to relocate temporarily during the runs of these experiments so that they are available to play their significant roles with approved JLab experiments. This sabbatical support program, supported by the lab contractor for ten years, contributes to building productive relationships between the universities and the Lab in support of the nation's scientific agenda. See also additional information under 4.3.3.

The corporate owner took steps to support the Lab's technology transfer and commercialization initiatives during the year. The owner's business development office provided expertise to the Lab's Technology Review Committee. During this period, the owner provided comments regarding the re-working of DOE's non-federal Work for Others Class Waiver (to update the existing 1982 class waiver); this effort is being facilitated by various DOE working groups, including the Technology Transfer Working Group. As a result of the owner's support to pursue, facilitate, and negotiate licensing arrangements for JLab technologies, during this performance period, a license agreement was negotiated with Omley Industries for the Lab's RF feed-through technology for cryogenic applications. The owner participates with Lab's Technology Review Committee in the evaluation, rating, recording, and marketing of all JLab invention disclosures. In an arrangement between the owner and the University of Virginia Patent Foundation, the owner provides market analysis of specific JLab disclosures and technologies. An example of such an analysis during this performance period is the invention entitled "*500 MHz Radio Frequency (RF) Phototube*." The Inteum software, used to automate the intellectual property process, is provided by the owner, including the annual licensing fee, hosted on the owner's server, and program maintenance and update. Corporate staff provides database support and management, as requested by the Lab, including creation of automatic reporting to satisfy various DOE and Lab management reporting requirements, registration of new invention disclosures, and new user registration.

The corporate owner continued to provide opportunities to showcase JLab technologies at its workshops and symposia. During the fiscal year, the Lab's facilities and capabilities – most notably terahertz technology – were featured by the corporate staff on a panel of the *World's Best Technology Showcase* in March discussing the "productizing of federal technologies." This event showcased undiscovered technologies emanating from top universities, labs, and other research institutions. Additional opportunities to showcase Lab technologies were provided at the 5th annual *SURA Terahertz Applications Symposium* held June 4 – 6, 2008. See June *On Target* news article *JLab Work Featured at SURA Terahertz Applications Symposium*. Participation included speakers from terahertz-related technology companies and JLab's FEL division. Results of the owner's contributory efforts to the Lab's technology transfer program are reported in Section 6.5.

There have been seven MOUs/MOAs signed during this performance reporting period, two more than in FY07, indicating the Lab's continued efforts to promote effective collaborations that will advance priority

issues in science. As noted below, the agreements include faculty appointments, the exchange of Research Scholars, and the loan of property between two collaborative scientific research facilities.

- University of Connecticut, signed October 31, 2007 → Broadens and strengthens the cooperation between these institutions by facilitating one new tenure track appointment at UConn in theoretical strong interaction nuclear physics research. This appointment will aid the Department of Physics at UConn in establishing an internationally prominent group in this field and play an important role in the research effort at JLab. As a result, the ability of both UConn and JLab to fulfill their missions will be enhanced.
- W&M, signed November 7, 2007 → Facilitates the two-year term appointment of a detector engineer to assist in the design, prototyping and construction of equipment that will be part of the CLAS12 detector being built within the scope of the 12 GeV Upgrade project. This work includes, but is not limited to, providing engineering support for the final design, construction, and quality assurance procedures for the High Threshold Cerenkov counter, Forward Tracking Chamber, and Preshower Calorimeter. It is anticipated that the majority of this work will be done on site at JLab in coordination with the 12 GeV Upgrade Hall B Assistant Project Manager, and the Hall B technical design group.
- University of Valencia, Spain, signed November 21, 2007 → Facilitates an exchange of Research Scholars in pursuit of graduate studies. These Research Scholars will aid the University's Department of Physics and the Accelerator Research Group at JLab.
- LPSC – Grenoble, France, signed December 12, 2007 → Facilitates an exchange of Research Scholars. These Research Scholars will aid the Department of Physics and support the Accelerator Research Group of Jefferson Lab in maintaining an internationally prominent group of both faculty and students in the research effort at JLab.
- TRIUMF Isotope Separation and Acceleration Facility (ISAC), signed January 31, 2008 → Outlines the loan of property between two collaborative scientific research facilities – JLab and TRIUMF. JLab will loan a thermionic electron source to collaborators at TRIUMF; the device will be used at the ISAC facility in the commission and completion of research projects titled E955, E984, E993 and E1075.
- Idaho State University, signed February 11, 2008 → Establishes a basis by which JSA/Jefferson Lab may negotiate a subcontract with ISU to provide a tenure track research assistant professor position. It will broaden and strengthen the cooperation between ISU and JLab by facilitating the support of research and education in the area of accelerator physics.
- The Hampton Roads Sanitation District (HRSD), signed March 7, 2008 → Cost-Sharing of Reclaimed Water Feasibility Study outlines the intent of the HRSD and JSA to undertake an engineering feasibility study and complete a project to reclaim wastewater for beneficial reuse at JLab.

There are currently 17 active Joint Faculty appointments; five exist at HBCUs and 16 are affiliated with a SURA member university. The appointments include 16 nuclear physics positions and 1 materials science position. Two appointments have been added in FY08, one with ODU and one with CNU. The first joint appointment ever in accelerator physics has been established. The position is currently being advertised and is initially aimed at positron source development. In addition, the Lab is in advanced discussion with ODU to create an Accelerator Science Center. The Director of the center would be a joint appointment between JLab and ODU.

There are eight active Bridged appointments, three more than at the end of FY07; two exist at HBCUs and four are affiliated with a SURA member university. There have been no new appointments in FY08 to date; however Idaho State University and the University of Connecticut positions have been filled and the individuals are slated to start in January 2009.

Measure 4.1.4 Requirement: JSA promotes and supports the Laboratory's corporate citizenship programs that encourage community support of the Laboratory and that draw on Laboratory competencies and meet community needs. These corporate citizenship efforts include public outreach and improved scientific literacy. The Laboratory also has an outreach program to the broader scientific community to increase the awareness and scientific community support of the Laboratory and its accomplishments.

TARGET: JSA promotes and supports the Laboratory's high level of awareness with the public, the scientific community and DOE and implements a high level of science education programs to improve scientific literacy. Activities such as a biennial facilities open house for the public; a broad portfolio of science education programs; hosting of high school and middle school science bowls; internships, thesis and poster awards for undergrad and grad students; open lectures on a wide-range of scientific topics; submissions of scientific articles in local, regional, and national news media; and showcasing of experimental results at meetings contribute to a high level of public awareness of the Laboratory, its programs, and science in general.

JSA Performance:

As part of the efforts to raise the public awareness of the importance of the Jefferson Lab to the local, regional, state, and national communities, an economic impact study, commissioned by the owners, was completed by The Wessex Group. This study describes the economic impact and benefits of the Lab currently and estimates its impact for the future (next eight years) with the completion of the 12 GeV project. The analysis is confined to the direct spending by the Lab, its contractors, the user community and visitors to the Lab. It does not attempt to establish the monetary value of either the intellectual impact of the Lab or the benefits of commercialization of the Lab's research. The information was integrated into the JSA's relations strategy to secure the additional funding from the Commonwealth of Virginia for the 12-GeV upgrade. More importantly, the analysis is being used to increase the scientific support of the Lab, a task that is crucial to a basic science user facility. This study, the first of its type on the Lab, was supported by the JSA Initiatives Fund and the JSA Board will continue to use the study results as a part of its relations program, to actively and publicly make the funding case for long-term basic research, including support for the Administration's FY2009 Office of Science budget request. See also additional information under 4.3.3.

A column written by the Lab Director highlighting the fact that the Lab's "unique scientific and technical requirement regularly produce unexpected benefits, including more than 67 patents since 1985" was published in the Richmond Times-Dispatch November 25, 2007. The article further contributed to the outside community's awareness of the Lab, its programs and science in general. The selection of a new Lab Director and the progress of the 12 GeV Upgrade project toward CD-3 provided additional opportunities for the Lab to educate and inform the general public. Following DOE's approval of the Lab Director selection, JSA officials provided pre-press notification to key policymakers (mayor of Newport News, State Delegate and Senator, State Cabinet secretaries, the Virginia Governor, and congressional members (House and Senate) of Dr. Montgomery's pending appointment. The JSA press release was broadly distributed to dozens of news outlets and science writers nationally. In addition to locally published articles in the Norfolk *Virginia Pilot*, Hampton Roads *Inside Business* and the Newport News *Daily Press*, the announcement was carried by *Science* magazine, distributed internationally by the Associated Press, as well as Interactions.org, an international physics communications resource. The progression of the 12 GeV Upgrade project was reported in the local and statewide daily newspapers, plus

such specialty publications as Photonics, Inside Business, PhysicsWorld (UK) and numerous other international publications (September 16, 2008). The Lab's research also garnered much national and international news media attention. Articles about proton spin research at the lab were published by several international outlets and included distribution to the general public by United Press International (September 16, 2008). Research about protons pairing with neutrons was published at the Science Express website (May 29, 2008), as well as Science News, Science Daily and many others.

The JSA Initiatives Fund supports the Jefferson Science Activities for Teachers (JSAT) program, providing local teachers with essential knowledge in math and science and effective teaching methodologies. A companion program to the Lab's Academies Creating Teacher Scientists (ACTS) program, JSAT supports the nation's goal to strengthen math and science. The program enables an additional 40 teachers per year to participate in this educational initiative. (ACTS supports 16 teachers per summer). Upon completion of the three year program, these additional 40 teachers can be expected to more effectively and enthusiastically teach the physical sciences to an additional 4,000 middle school students. The educational content includes JLab-related science activities, projects, and/or lectures. Teachers are provided teaching strategies and educational materials to effectively teach the required coursework for the current grading period. The JSA Programs Committee believes this Initiative Fund project has high return in the development of K-12 education in the math and sciences. See also additional information under 4.3.3.

The JSA Initiatives Fund also supports the Research Internship for Foreign Undergraduates (RIFU). As a companion program to the DOE-funded Science Undergraduate Laboratory Internship (SULI) program, this program supports four research internships specifically for foreign students. The RIFU program supplements the SULI program (which is available only to U.S. citizens) offering paid internships to foreign students, providing these internships to undergraduate students from the international JLab community with whom the Lab has collaborations. The four internships were awarded based on a competitive selection process. The internship period runs concurrently with the SULI program, both for administrative efficiency and for the full and valuable impact of interns of different cultures working together for the ten week period. See also additional information under 4.3.3.

Science Education Metrics for October 1, 2007 through September 30, 2008:

- 10,238 Students Served – 33,683 Student Contact Hours
- 2,036 Teachers Served – 8,082 Teacher Contact Hours

The Science Education staff was selected to conduct workshops for more than 300 teachers at regional and national NSTA (National Science Teachers of America) conferences in Denver, Colorado (November 2007); Birmingham, Alabama (December 2007); and Boston, Massachusetts (March 2008). The workshops included information about JLab and several teaching strategies to enhance middle school education in the physical sciences. JLab also hosted the national Teacher-to-Teacher Workshop (sponsored by the US Department of Education and the US Department of Energy Office of Science) on July 9-10 for 150 teachers.

JLab's Science Education program was featured in an article published in Education Week November 16, 2007 – *Scientists Nurture Teacher's Growth in Math and Science*, with special recognition given to the ACTS program and mentor Staff Scientists in Hall A. In May 2008, the



Jan Tyler, JLab's Science Education manager, accepts a Programs That Work award from Virginia Secretary of Education Thomas Morris. DOE's ACTS program at JLab was one of the five programs from across Virginia that was recognized with the award.

Science Education department received the Virginia Mathematics and Science Coalition “Programs That Work” award. This award is given out every five years in recognition of teacher programs across the Commonwealth. The DOE ACTS Program at JLab was one of the five programs to receive an award.

The Virginia Regional High School Science Bowl was hosted at JLab on February 2, 2008. Twenty teams competed to participate in an all expense paid trip to DOE’s National High School Science Bowl that was held in Washington, D.C. May 1 – 6, 2008. The Thomas Jefferson High School for Science and Technology won the JLab-hosted competition for the seventh consecutive year and was the third place winner at the National Finals. The Virginia Regional Middle School Science Bowl was also hosted at JLab and took place on March 1, 2008. A total of 16 teams competed for the opportunity to attend DOE’s National Middle School Science Bowl that was held in Denver, Colorado June 19 – 22, 2008. Kemps Landing Middle School won the JLab-hosted competition. In addition, JLab co-hosted the 74th Tidewater Regional Science Fair on March 8, 2008. This event was held at ODU and included participation from more than 250 middle and high school students.

JLab served on the planning committee for the Virginia Association of Science Teachers (VAST) Professional Development Institute, which was held in Williamsburg in November 2007 and attended by over 850 teachers. The Lab was also on the organizing committee for both the Middle and High School National Science Bowls for the Department of Energy noted above. Approximately 500 students competed in the national events.

As a good neighbor, the Lab also hosted the annual Youth Forum for the Southern Growth Policies Board meeting (an arm of the Southern Governors' Association) to increase public awareness of the lab mission and facilities. This event was held at JLab on February 25, 2008 and it was attended by more than three dozen regional officials and invited guests.

Jefferson Lab again participated in Christopher Newport University's "Lifelong Learners" program. Under the program, 25 adult learners, age 55 and older, spent a week in July at Jefferson Lab, learning about the lab's research and nuclear physics program. Daily classes were taught by JLab physicists and technicians. The educational program included overviews of: Jefferson Lab and how an accelerator works; the lab's experimental program and how experiments are conducted; the lab's computer capabilities; the lab's free electron laser; and the lab's medical imaging program. The course was a huge success, providing a unique opportunity for JLab staffers to engage with local citizens. Class participants wrote glowing reviews about JLab and said they would encourage others to take the course when it is offered again in two years.

Other public forums of interest are the Science Series events and the lecture series that are held at CEBAF Center after hours. Some of the free events and lectures that have occurred during this performance reporting period include, *Forensic Dentistry: Unraveling Mysteries of Ancient Egypt, Modern Crime Scenes* – presented by forensic odontologist, Dr. Elizabeth Ruth Smith, D.D.S; *The Laser at 50* – presented by Dr. Michelle Shin, JLab; *Astronomy with Neutrinos* – presented by Dr. Albrecht Karle, University of Wisconsin; and *The Civil War Unplugged* – presented by Dr. Chuck Ross, Longwood University.

TJSO 3rd Quarter Feedback → *The Science Education programs continue to perform at an exceptional level. Several sabbatical awards made to Universities contribute to continuing to enhance collaborations. The laboratory established good communications with state officials as evidenced by visits from State elected officials. No other comments at this time.*

Measure 4.1.5 Requirement: Develop a baseline for understanding and trending the cost of doing business.

TARGET: Identify and bin major laboratory costs identifying direct and indirect labor FTEs and costs as well as various operating costs, such as utilities, by December 31, 2007. The cost structure and associated baseline cost of doing business is sufficiently detailed (i.e. including all funding and costs, both direct and indirect with associated FTEs) so the laboratory and the Site Office have a common understanding of how the money is spent and the various cost drivers that effect the laboratory's cost of doing business.

JSA Performance:

The Lab was very proactive in developing a solution to this requirement from SC and worked together with the TJSO Site Manager to develop acceptable PEMP language for incorporation into all SC PEMPs. JLab was the first to submit our proposal for monitoring the Cost of Doing Business to the SC.

JLab worked closely with TJSO in the 1st quarter to develop a Cost of Doing Business baseline for JLab. This included developing a presentation for DOE that identified the major cost drivers at JLab as well as the formulation of the baseline numbers. The presentation also outlined the tracking reporting requirements for the Cost of Doing Business and during the second quarter, JSA developed automated reports to meet these requirements and posted them on Insight for easy access by DOE. The first quarterly review of this data was accomplished on April 24th. Progress on development of informational data to be posted on Insight for TJSO access and information was demonstrated. Additional information in the form of support for overhead variances was discussed for development. Reviews were also conducted for the 2nd and 3rd quarter and a Cost of Doing Business status was prepared for a briefing to the SC COO in July.

JLab also took the initiative to prepare a multi-faceted strategy that discusses the Cost of Doing Business and Infrastructure Investment and the impacts of a declining budget level and unfunded mandates. This strategy included specific examples of initiatives and accomplishments in FY08 and previous years. The strategy also outlines some examples of activities in FY08 related to new/changed DOE requirements that require resources freed up by any efficiencies gained.

TJSO Mid-Year Feedback → JSA's vision appears to address outstanding science questions. The Lab coordinated visits from key state elected officials during the first half of the year. The Lab completed the Business Plan on October 18, 2007. Only minor changes were made to the plan. The Lab provided important collaborations through the incorporation of Laboratory initiatives in the NSAC Long Range Plan; and the lab's leadership in both national and international nuclear physics communities is notable. The Laboratory has managed very well the FY 08 budget and program priorities under challenging circumstances. Insight reporting has been very beneficial. The Laboratory appeared to effectively utilize the Initiatives Fund in supporting the Laboratory mission. The Lab signed two more MOUs/MOAs that in FY07 further strengthening collaborations. The Lab's teacher education program added 40 additional teachers in the Labs Academies Creating Teachers Scientists (ACTS).

Objective 4.2 Provide for Responsive and Accountable Leadership throughout the Organization

Objective Requirement:

In measuring the performance of this Objective the DOE evaluator(s) shall consider the following:

- Leadership's, to include Corporate Office Leadership's, ability to instill responsibility and accountability down and through the entire organization; and
- The effectiveness and efficiency of Leadership, to include Corporate Office Leadership, in identifying and/or responding to Laboratory issues or opportunities for continuous improvement.

Measure 4.2.1 Requirement: JSA's Board of Directors and its corporate owners assure effective leadership of the Laboratory and provide timely and effective policy guidance and oversight; offer subject matter expertise; facilitate corporate reach back; and provide entrée to vital, external resources for support of science and the programs of the Laboratory. JSA establishes an efficient organization that:

- Focuses the Laboratory Director on corporate, strategic, customer and stakeholder goals, priorities and issues.
- Empowers the Chief Scientist to provide overall direction for balanced, highest impact science.
- Empowers COO to integrate operations and business management functions-deliver more science with efficiencies.
- Optimizes matrix support functions to assure efficient deployment of resources.
- Fully integrates safety throughout the organization.
- Formalizes and documents roles and responsibilities and accountability and authorities.
- Organizes outside support for science and the programs of the Laboratory.

TARGET: The JSA Board and its Committees provide responsible leadership and hold the Laboratory accountable for performance as measured by: reviews of JLab leadership on an annual basis; succession planning for key positions; identification and resolution of strategic issues that can impact the overall performance of the Laboratory; timely response to Laboratory issues and guidance for implementation of effective actions; cognizance of significant issues and monitoring of status of corrective actions; effective process to hold the laboratory management accountable for performance, including an effective and comprehensive self-assessment process; formulation of a safety strategy that is incorporated into management evaluations; effective communication with Laboratory stakeholders to garner support for the initiatives in the DOE Strategic Plan and other initiatives of the Laboratory; an effective and integrated Quality Assurance program.

JSA Performance:

The JSA Science Council heard presentations from the Lab on its science program, status of the 12-GeV upgrade, and the FEL program. The Council discussed the need to develop the science program for the FEL, and acknowledged that this would be part of expectations of the next Director. The Council discussed with Lab leadership such matters as access to the Lab by foreign nationals, the Lab's pursuit of multiple scientific objectives, and the strategy for evaluating additional proposals for the 6-GeV program, etc. The Council will make its recommendations to the JSA Board for consideration at its next meetings.

The corporate owner sponsored the *Enabling Grand Challenge Science: the Light Source of the Future Workshop* with Louisiana State University and Florida State University in January 2008, to begin discussions among the regional scientific community about next generation light sources. See also additional information about this workshop under 4.3.3. At its semi-annual meeting in early April, the owner's (SURA's) Board of Trustees heard from the Lab Associate Director for the FEL on the development of 4th Generation Light Sources and a potential role that the Lab could play, as well as the opportunity for universities to engage in the source definition and siting of a major new facility in the southeast. These efforts are in support of the DOE Basic Energy Sciences "science grand challenges." The corporate owner voluntarily sponsored this workshop in recognition that while the larger discussions regarding a potential role for the Lab should have the input of its next Lab Director, the early engagement of the science community in support of the BES agenda is an opportunity that warranted this support.

The Programs Committee met in early April, at which time it discussed agenda items which included: preliminary discussions with the JLab AD for FEL regarding next generation light sources; status report on performance of Jefferson Lab, report of the Users Group, report from the Director's search committee, status of the owner's contractual commitments (relations program and Initiatives Fund), review of the FY2009 Initiatives Fund request for proposal process, report on the SURA Residence Facility.

During the first quarter, the Director's Search Committee re-engaged, following the decline of the Board's offer to the leading candidate for the JSA President/JLab Director position. The Search Committee worked with the JSA Compensation Committee to address the interim period until another candidate was identified to ensure that the Lab's performance of its mission and commitments to the Department was not adversely affected.

The Board and Compensation Committee conferred to finalize various aspects of Lab Director hire. JSA Board directors met with TJSO to provide close-out report on director's search process. The Compensation Committee finalized the employment agreement with the Lab Director designate agreeing to a September start date, and a formal announcement was made on April 3. In the interim period, JSA implemented a transition plan which included the continuation of the Lab Director in the leadership role, while putting in place a JSA agreement with the Director Designate to spend the necessary time at the Lab to ensure a seamless leadership transition. The Director designate attended several meetings and reviews at the Lab and in behalf of JSA in anticipation of his pending leadership role. In addition to this owner-provided resources, the owners committed to other monetary support contributing to an effective leadership transition including employee morale activities and other types of support. See discussion under 4.3.3.

During the fourth quarter, the Operations, Safety & Risk Management, and Finance Committees met and heard presentations from the Lab leadership on the operational, safety, risk, and fiscal aspects of the Lab's programs, including the free electron laser. The Committees discussed with the Lab potential sensitive / classified information issues, the third quarter status of the Lab's performance against the PEMP, executive leadership program, Board-sponsored safety review, and the impact of the FY2009 budget situation.

The Science Council met in late 4th quarter at which time it heard from Council members and JLab leaders on the science program, 12-GeV project, 21st century light source, and Lab's FEL program. The JSA Board appointed Dr. Eric Isaacs, Argonne National Lab Deputy Director for Science Programs, to serve on the Science Council. Dr. Isaacs' appointment brings additional expertise to the Council, particularly in the field of free electron laser science. Meeting outcomes will be reported in FY2009.

Opportunity for Improvement:

- TJSO 1st Quarter Feedback → *TJSO rates 1st Quarter performance as "RED." Notwithstanding the efforts and accomplishments of the JSA Board, SURA and CSC, the Department is very disappointed that a Laboratory Director has not been named given that the current Director announced his retirement approximately 12 months ago.*

Status: On December 20, 2007, three days after the first candidate's decline of the Board's offer of the Lab Directorship, the Search Committee Chair re-engaged the other top candidate (Dr. Hugh Montgomery) who agreed to reconsider the director position during the holidays and his pre-planned foreign travel. On January 2, 2008, the Board secured the agreement of the incumbent Lab Director, Dr. Christoph Leemann, to stay on in his leadership role through June 2008. On January 3, the JSA Board and members of the Search Committee began discussions regarding additional potential candidates and the engagement of a national search firm while Dr. Montgomery reconsidered. The months of January and February were dedicated to the search efforts, including meetings of the JSA Compensation Committee and the JSA Board, as several Search Committee members proceeded with the various aspect of the highly sensitive recruitment process that culminated in the offer of the position to Dr. Montgomery. As the national search firm proceeded with further recruitment of a wider field of potential candidates, the Search

Committee conducted its due diligence review of its top candidate and prior to recommending Dr. Montgomery's appointment as JSA President/JLab Director to the Board and the DOE. As soon as the review was completed to the Board's satisfaction on March 10, the Search Committee notified the Department and arranged Dr. Montgomery's meeting with the appropriate DOE officials, including the Secretary and Under Secretary. Following these meetings scheduled by DOE on March 31, Dr. Montgomery accepted JSA's offer on April 1.

The JSA Board had Dr. Leemann's support to effect a seamless transition that had the least adverse impact on the Lab. In the best interest of both JSA and DOE, Dr. Leemann continued as Lab Director until Dr. Montgomery's arrival on September 2, 2008. The JSA Board believes that all actions taken by the contractor during this search process have been reasonable and in full recognition of the need to identify the best leader to carry forward the mission of the Lab in support of the Office of Science. While the international search committee considered a broad pool of candidates, it determined that the best leader for the Lab, given its program dedicated mission, was an outstanding leader in his or her field of JLab-related science. As with all recruitment for top leadership positions, the timing is often influenced by the potential candidates. The Board also notes that the contractor's obligation to provide responsible leadership holding the Lab accountable for performance of its contract during this period of the Director's search has been fulfilled as evidenced already by the high performance of the Lab via the FY2007 Performance Evaluation and Measurement Plan, and as the Board anticipates will again be evidenced by the results of the FY2008 Performance Evaluation and Measurement Plan.

During this period, a vacancy occurred in the key personnel staff when the Associate Director for ESH&Q left the Lab in January. During the recruitment process, an Acting AD was appointed, and the Lab Director conferred with and kept the Compensation Committee apprised of progress on the efforts to fill the vacancy, ensuring through periodic reports that the Lab's ES&H program continued on its course toward a comprehensive and integrated ESH&Q program. A selection was made in May 2008 for a highly qualified individual with prior experience both in the DOE science Lab system (previously at Fermilab) and with the DOE. The new AD for ES&H, Mary Logue, is responsible for ensuring that JSA continues its proactive program toward an effective integrated safety management system. The results of the Lab's integrated safety, health, and environmental protection are addressed in Goal 5.0.

- TJSO 3rd Quarter Feedback → *The Department is pleased with the completion of the lengthy evaluation process and selection of a new Laboratory Director during this reporting period.*

See discussion under 4.3 regarding JSA Board and corporate role in ensuring an effective transition of Lab leadership (director).

- TJSO Letter Dated April 23, 2008 "Modification M045, Contract Implementation Action Plans" → *I am disappointed by the laboratory's submittal in that it did not provide any of the required compliance implementation action plans anticipated; particularly since much of this effort has been completed in the past year of the laboratory's Contract Requirements Value Analysis process. In JLab's May 30, 2008 submittal, please provide the rationale for the duration to achieve full compliance by the dates indicated in the April 11, 2008, submittal. In addition, please provide your assessment of the laboratory's ability to operate during the interim period prior to the full compliance dates specified in the attachment to the April 11, 2008, letter. Also, please note that the laboratory's response in bringing this process to closure will be considered during the Site Office's FY2008 performance evaluation of the laboratory."*

Status: During this evaluation period JSA completed its extensive review of over 100 contract requirements and directives - a task that was completed well in advance of the 24 month time line established in May, 2006. To complete this task, JSA mobilized a High Performance Work Team that included subject matter experts across the Lab and a representative of the JLab Site Office. The HPWT evaluated in detail all the new 81 Contract Directives and agreed upon quarterly analyses were submitted by JSA to TJSO in a timely manner by June 30, 2007. TJSO reviews and comments were completed in November 2007 and JSA's Implementation Plan Approach was submitted to TJSO on December 21, 2007. Final agreement on the implementation approach was reached in February 2008, although differences in some particular contract requirements continued under discussion. As a direct result of this effort, 35 Contract Directives were eliminated by contract modification on March 11, 2008 leaving 52 new directives to be implemented in a planned approach. JSA did submit its Directives Implementation Plan to TJSO on April 24, 2008. The plan addressed each directive and its compliance status. JSA assessed its compliance status and the Lab is in full compliance with 41 of the 52 DOE Orders. Implementation Plans for the remaining Orders were submitted on May 30, 2008 and full or partial compliance will be dictated by the actions required to meet compliance expectations of the Order. After TJSO review of the implementation plans there were several that required additional investigation and review, which involved specialists from ORO and/or HQ. In particular, DOE 430.2b, DOE O 151.1C, DOE O 435.1, and DOE M 435.1-1 were subjects of additional review and study. DOE O 430.2b implementation plan was completed and submitted on schedule according to the expectations of the directive. The other three directive implementation plans will be revised, updated, and finalized in early FY09. Two directives, DOE M 460.2-1A and DOE O 450.1A, were revised directives which were modified into the JSA Contract late in the fiscal year. These directive revisions required a re-review of their corresponding implementation plans which were revised and re-submitted to the site office. This monumental effort was accomplished during a period of declining budgets and significantly reduced staffing with pressure from DOE to control overhead costs. In summary, JSA believes its conduct of this exhaustive review is in full agreement with its commitments to date. A similar although less comprehensive effort in 1997 won the Lab a Golden Hammer Award from Vice President Gore.

- TJSO Mid-Year Feedback → *Although the Lab conducted an extensive review of the Contract Requirements, the Site Office believes that this process could have been accomplished with a more efficient review process.*

Status: The directives review process was completed on schedule in June 2007 as committed to DOE. Furthermore, the review team completed the project in 9 months versus the 18 months it took to conduct the Work Smart Standards review performed by SURA in 1996. JSA had a particular vision of how to proceed with implementation plans, which was presented to DOE in December 2007; around the time DOE was completing their review of the JSA submittals. The approach for submission of implementation plans was not fully agreed between TJSO and JSA until Spring 2008. DOE Orders were quickly reviewed for compliance against existing processes and procedures and approximately 33 of 52 directives were found to be in compliance. Three of the 52 were already being implemented under existing implementation plans (DOE 210.2, DOE O 414.1C, and DOE 226.1A). The remainder required implementation plans which included operational or programmatic impacts, actions to implement specific aspects of the directives, and any costs associated to bring the directive into full compliance. Several implementation plans were completed by the end of the fiscal year. There are currently 11 directives in the process of implementation according to their current or revised implementation plans. Funding and budget constraints remain a concern surrounding full implementation of several plans as there are

resource and cost requirements to bring JLab into full compliance with DOE Directive expectations.

- TJSO Mid-Year Feedback → *The corporate owners sponsored the Enabling Grand Challenge Science: The Light Source of the Future Workshop with Louisiana State University and Florida State University in January 2008.*

Objective 4.3 Provide Efficient and Effective Corporate Office Support as Appropriate

Objective Requirement:

In measuring the performance of this Objective the DOE evaluator(s) shall consider the following:

- Corporate Office involvement in and support of business and other infrastructure process and procedure improvements;
- The willingness to enter into and effectiveness of joint appointments when appropriate; and
- Where appropriate, the willingness to develop and work with the Department in implementing innovative financing agreements and/or provide private investments into the Laboratory.

Measure 4.3.1 Requirement: The JSA Board provides corporate expertise and reach back to demonstrate its commitment to the success of the Laboratory in its provision of effective leadership and management, business support processes, and infrastructure needs. The JSA Board and its Committees are comprised of experts and leaders in science, education, and industry, who bring to bear tangible and intellectual resources to carry out the primary responsibility to manage and operate the Laboratory in accordance with the JSA/DOE contract and in support of the DOE scientific agenda.

TARGET: The JSA Board and Committees meet regularly to monitor and ensure that the Laboratory's performance meets or exceeds DOE expectations. The Board and Committees also convene in special meetings to address management and operational issues as they arise and to provide timely guidance to effectively resolve issues. Provides necessary additional resources including reach back through its owners and Board and Committee members to ensure that the necessary leadership and management team, business support processes, and infrastructure needs are addressed appropriately and in support of the Laboratory's vision and business plan. Monitors scientific and operational reviews of the Laboratory and addresses findings in a timely and effective manner mutually acceptable to JSA and DOE. The Board and Committees assess best management practices approaches and systems utilized at the Laboratory to ensure cost effective and efficient support of the Laboratory's mission, and implement corrective actions and/or improvements when warranted or determined necessary to maintain effective support.

JSA Performance:

During the performance period, the Board and its Compensation Committee met on several occasions to discuss the status and progress of the director's search and its related activities, including the plan to ensure that there was no gap in the lab leadership. Specific discussions of these meetings are addressed with the JSA performance related to the director's search process under Goal 4. Other committee meetings during this period include: Science Council (see discussions under 4.2.1), Programs Committee (see discussions under 4.2.1, 4.3.3), Relations and Outreach (see discussions under 4.1.1, 4.3.2); Operations, Safety & Risk Management, and Finance Committees (see discussions under 4.2).

FY08 Challenges:

- FY07 DOE Evaluation Report → *In 2008, JSA Board should take steps to enhance the dialogue between the JSA Board and the Site Office. Enhanced dialogue can strengthen communication,*

feedback and improvement between the Site Office and the Board, provide an opportunity for the Board to present progress on Board initiatives and to convey the Board's strategic planning and other efforts in support of the laboratory.

Status: In response to the feedback to the JSA FY07 assessment and the TJSO's noted FY08 challenge regarding the need to improve communication between the JSA Board and the Site Office, the owner's Chief of Strategic Services was assigned as the JSA corporate liaison to meet regularly with the Site Office Deputy Manager to keep the TJSO apprised of the progress on the activities and proceedings of the Board and its Committees. In the monthly meetings since January 2008, information regarding the status of Initiatives Fund activities, relations support, and other contractor contributions; board activities; and committee activities has been shared and discussed. In addition to these regular meetings, members of the JSA Board of Directors (Jerry Draayer, Lawrence Hare, Thomas Appelquist, Stephen Wallace) have met with the Site Office during this performance period to discuss the Board's involvement with the director's search process and the purpose and status of the Initiatives Fund.

The JSA Board noted it would include an opportunity for the Site Office to join a session at its next regular meeting to better understand the TJSO, its role and responsibilities, the DOE's view of how the Lab is performing and where attention is needed. This would be the opportunity for the TJSO to discuss with JSA Board areas where DOE believes require corporate and Board attention.

During fourth quarter, the JSA Board held its meeting at the University of Virginia at which time it heard from the new Lab Director on the status of the Lab's science program, budget outlook, safety performance, and operational topics; from the owners and their assessments of the Lab's performance and other corporate matters; and from company officers on governance and financial issues. The Board also heard reports from each of its committees and discussed the committee proceedings, outcomes, and status of prior committee commitments. The TJSO was unable to join for this Board meeting as originally planned due to schedule conflicts. The JSA Board will offer the opportunity for the TJSO's involvement at its next board meeting to provide a forum for the TJSO to discuss with the Board areas where DOE believes require corporate and Board attention.

- TJSO Mid-Year Feedback → *The Board established improved communication with the Site Office during this reporting period. The Site Office looks forward to active participation in JSA Board meetings to further enhance this communication process. The Laboratory should be commended for effective communication with the State of Virginia in supporting the Laboratory mission. Enhanced transparency appears to exist in the JSA management of the Initiatives Fund.*
- FY07 DOE Evaluation Report → *Laboratory Director indicated his intent to step down in October 2007 and willingness to remain through December to help with the transition to the new Director. One of the most important contributions JSA and its corporate owners can make to the laboratory is the selection of the Director. While selection of a highly qualified individual is paramount, a significant delay in the report date of the new Director will influence the Department's FY08 evaluation of JSA.*

Status: See also performance assessment addressing the TJSO's feedback under 4.2.1. The JSA Board engaged a thirteen member international search committee that included six Science Council members, charged with ensuring that the next leader of the Lab would continue to innovatively maximize its scientific and operational resources while staying on track with the

vision and the Department's long-range plan. Members of the search committee reported back regularly to the JSA Board on progress being made to fulfill this charge. Board members provided valuable (and sensitive) information to the search committee regarding potential candidates. The Board reiterates its full support of the contractor's actions, processes, and timeline that led to the selection of the best candidate as the follow-on JSA President/JLab Director. The Board emphasizes that the contractor has ensured that there will not be a gap in the JLab leadership and believes that the Lab's FY2008 performance measured against the agreed-upon Performance Evaluation and Measurement Plan will substantiate this continuous effective leadership.

Opportunity for Improvement:

- TJSO 3rd Quarter Feedback → *TJSO recently reviewed JSA's fire protection program. During the review, several shortcomings were noted; the most significant being JLab's lack of conformance to DOE-required alternative protection schemes associated with a 1991 DOE-approved exemption for the experimental halls. As a result, TJSO determined that the shortcomings require prompt attention. JSA's fire protection program is essential to the protection of federal property and mission continuity. TJSO has requested compensatory measures be developed and implemented until long term fixes are in place. Prompt and timely actions by the lab are required to address program shortcomings.*

Status: The Lab resubmitted the Fire Protection Corrective Action Plan to the Site Office during the 4th quarter which was approved on October 16, 2008. Jefferson Lab also obtained the services of Mr. Dennis Kubicki, Fire Protection Engineer, to evaluate the adequacy of the fire protection features for the three experimental halls. The evaluation as well as a draft Exemption Request for Fire Sprinkler Protection for the experimental halls is being forwarded to TJSO.

Measure 4.3.2 Requirement: The JSA Board proactively pursues opportunities that strengthen and facilitate the Laboratory's ties to academe and to the user community, both by improving upon current programs and initiatives, and by evaluating newly proposed programs and initiatives that enhance the basic science and research programs of the Laboratory.

TARGET: Monitors current programs that strengthen the Laboratory/academic connection and the Laboratory/user community to ensure continued relevance and implements programs enhancements as appropriate. Evaluates new proposals that further the Laboratory's science and technology programs and supports the vision and DOE's scientific agenda.

JSA Performance:

During the first quarter, members of the JSA Relations and Outreach Committee continued to establish JSA's relationship with the Lab's non-DOE funding sources, including relations-building with various Commonwealth of Virginia legislative and executive offices. These efforts followed the JSA Board Chair's letter to the Governor in this first quarter urging the state's continued support with additional funding for the 12-GeV upgrade and Hall D construction. The Governor's proposed budget included funding of \$7.5 million over the biennium for the upgrade project. The Governor's budget request also included \$1.5 million appropriation for the general support of the Lab, including its Governor's Distinguished CEBAF Professorships and Governor's Distinguished CEBAF Scientists program, a program that the JSA Board Chair in his prior role in the State administration helped to launch.

Also during the first quarter, as part of its relations program and overall relations strategy and in demonstration of its active corporate commitment, the owner worked with the Wessex Group to perform an economic impact study of the Lab to the region and the nation by evaluating the Lab in its current state

and usage and its potential increased economic impact with the completion of the 12-GeV upgrade. (A preliminary draft report was provided to the TJSO manager per his request.) This study now completed has been and will continue to be used for support and advocacy of funding requests for the Lab.

The JSA Relations and Outreach Committee, co-chaired by two university presidents (John Casteen, University of Virginia, and William Harvey, Hampton University) is a resource to the Board in developing a relations strategy appropriate for the Lab and consistent with the plans of the broader scientific community as endorsed by the NSAC. Members of this Committee have provided effective guidance to JSA in its advocacy of the Lab. The results of JSA relations efforts that occurred during this period include:

- The final Commonwealth of Virginia 2008-2010 biennium budget includes general appropriations of \$1.5 million/year, representing an increase of \$.5 million over prior year. In addition to this increase in general appropriations, the state has included \$6.0 million in 2009-2010 for the 12-GeV Upgrade project.
- The Defense appropriations for the Free Electron Laser program for the current fiscal year includes \$1.6 million (Air Force) and \$2 million (Navy)

Relations Support and Activities: JSA, including members of the owners' corporate staff, continued to engage in various relations and outreach activities during this performance period.

- JSA owner signed on with other industry, association, and academic leaders, letter of support of supplemental appropriations conference to Congressional leadership adding funding for NSF and DOE SC. This, along with ongoing relations efforts in support of the America Compete's Act, contributed to the end result of the enactment of a FY2008 Appropriations Emergency Supplemental of \$62.5 Million for the Office of Science (ITER, FermiLab, SLAC, APS) (see <http://www.sura.org/news/docs/CongLtr060308.pdf>.)
- JSA owner continued to focus relations efforts on the FY2009 appropriations bills in both houses of Congress, including meetings of the Energy Sciences Coalition at which the Under Secretary discussed the FY2009 budget request, possibility of a six-month continuing resolution, and the need for long-term basic research and science funding. Relations activities included advocacy for full support and funding of research in the FY2009 budget inline with the America Competes Act through the Task Force on the Future of American Innovation (see <http://www.sura.org/news/docs/TFFAISenateCR.pdf>, as well as the owner's endorsement through the Energy Sciences Coalition (see press release at: <http://www.sura.org/news/docs/ESCPR091708.pdf>.)
- JSA owner followed up with DoD staffers on FEL funding requests and to ensure timely receipt of ONR funding for remainder of Fiscal Year. FY2009 funding pending appropriations committee outcome.

More details regarding the JSA relations program, overseen by this JSA Committee, is in 4.1.1 and 4.3.3.

Measure 4.3.3 Requirement: The JSA Board provides non-DOE resources (personnel and/or funds) through its owners, other organizations, and private sources to support programs, initiatives, and activities that promote and/or enhance the basic science and research programs of the Laboratory, and that support the Laboratory's extended user community.

TARGET: Commit an annual \$0.5M Initiatives Fund to support programs, initiatives, and activities that strengthen the Laboratory's scientific outreach and users programs and provide for new programs and program enhancement. Provides the relations and outreach support that underpins a successful strategy to acquire other funds and resources (land, personnel) that support

Laboratory programs and facilities.

JSA Performance:

During the first quarter, the JSA Programs Committee made its recommendations for FY2008 awards for support from the JSA Initiatives Fund (total estimate ~\$500,000) including: the JSA/JLab Graduate Fellowship Program; JSA/JLab Sabbatical Support Program; JSA/JLab Nathan Isgur Senior Post Doctoral Fellowship; Director's Discretionary Fund; Hampton Roads Economic Impact Study; Membership-Hampton Roads Partnership; Patent Awards; various JLab Users Activities (thesis prizes, poster awards, student registrations and support at Users Group meeting, student registrations at *International Symposium on Field Theory on the Lattice*; Users Group relations building activities; conference travel support; post doctoral fellowship; support for Users Group satellite meetings; student tour guides); Research Internship for Foreign Undergraduates; Hall B, CLAS, 12 GeV Architectural Model; JLab Science Activities for Teachers (JSAT), and Workshops. The JSA owners accepted all recommendations.

TJSO Mid-Year Feedback → *The Site Office was please with the refinement of the Initiatives Fund process to enhance the understanding and transparency for those proposing new projects. No other comments at this time.*

Opportunity for Improvement:

- FY07 DOE Evaluation Report → *To assist in DOE's annual evaluation of JSA's performance in Objective 4.3, it is requested that JSA provide a self-assessment of performance relative to each proposal commitment accepted by DOE in the award of the contract to JSA. The self-assessment should be provided to TJSO on or about October 31st of each year.*

Status: See status below.

- TJSO 1st Quarter Feedback → *JSA is encouraged to involve Laboratory senior management in the decision making on the "Initiatives Fund" to help ensure that optimization of the fund is achieved.*

Status: The DOE accepted JSA's commitment to provide \$0.5 million per year to establish a fund to leverage specific programs, initiatives, and activities at the Lab that further scientific outreach and enhance the Lab's scientific and technology programs. To address the Site Office feedback, both in its FY2007 evaluation and in the 1st quarter FY2008 feedback, JSA assigned the owner's Chief of Strategic Services to meet regularly with the TJSO to keep the Site Office apprised of status of the individual proposals supported by the Initiatives Fund. The following is the mid-year assessment of these funded projects.

JSA/JLab Graduate Fellowship Program. The JSA Programs Committee awarded eight graduate fellowships for the 2008-2009 academic year to students at SURA member universities. This program was first established by the SURA Board of Trustees in 1989. It makes available, on a competitive basis, fellowships for doctoral students at SURA member universities conducting research related to the theoretical and experimental programs at Jefferson Lab, including nuclear and related particle physics, accelerator physics, and the Lab's free electron laser program. These fellowships increase the opportunities for graduate study at the Lab, enhancing the research capabilities of outstanding students in the field. Awards were made this year to graduate students from: Florida State University, University of Virginia, Old Dominion University (2 awards), Virginia Tech, Rice University, Duke University, and Massachusetts Institute of Technology. Including these awards, 141 graduate fellowships have been awarded to nineteen different universities. Institutions with students receiving more than five awards during the life of this

program include: College of William and Mary (27 awards); University of Maryland (20 awards); University of Virginia (18 awards); North Carolina State University (16 awards); Old Dominion University (14 awards); Florida State University (11 awards); University of South Carolina (8); and, Massachusetts Institute of Technology, which joined SURA in 2002 (7 awards). The significance of this program is its long range impact in developing and training the future generation of physicists and scientific leaders, particularly in JLab-related science. Furthermore, these opportunities for graduate students to be involved in the highly-rated approved experiments of the Lab bring additional resources and support to the Lab in return for the training ground the Lab offers to potential future science leaders. The selection committee for this year's awards included representatives from SURA member universities, JLab, and the JLab Users Group. The committee agreed that the enthusiasm of the seventeen applicants "elucidates clearly the continued attractiveness both of JLab's facilities and of its physics." The JSA Programs Committee believes that this program is an important element in the research and education of the next generation of scientists. See also additional information under 4.1.3.

JSA/JLab Sabbatical/Research Leave Support Program. The JSA Programs Committee awarded sabbatical support to two faculty members, one from Florida State University and one from Florida International University (a Minority Serving Institution), who will be conducting research on JLab approved experiments during their sabbatical leaves from their home institutions. Monthly support allows faculty researchers to offset the expense of relocating temporarily to the Lab vicinity during their participation in experiment runs. Including this year's awards, since the inception of the program ten years ago, seventeen awards have been made. The selection committee for this year's awards included representatives from SURA member universities, JLab, and the JLab Users Group. The JSA Programs Committee believes that this program achieves its intended purpose to: enhance the research opportunities for faculty through access to the Lab facilities and interactions with Lab staff and users, strengthen the teaching and research capabilities of university through faculty involvement, and strengthen the research programs of the Lab by attracting "new blood." See also additional information under 4.1.3.

JSA/JLab Nathan Isgur Post Doctoral Fellowship. During this performance period, the Lab successfully recruited and hired the Nathan Isgur Senior Post Doctoral Fellow. The award, which has been presented once before, was established by the predecessor contractor to honor the service of the late Nathan Isgur who served as the Lab's chief scientist from 1990 – 2001, by providing an opportunity for the Lab to attract new talent that can enhance significantly its theory or experimental research capabilities in nuclear physics. The second Nathan Isgur Fellow was selected from four finalists who were invited to present to and be interviewed by the Lab. The JSA Programs Committee believes that its support of this Fellowship supports the Lab in attracting new talent into its research programs.

Director's Discretionary Fund. Annually, up to a quarter of the Initiatives Fund is provided to the Lab Director for the support of such activities as: employee morale initiatives, user and guest support, community and corporate citizen initiatives, educational outreach support, miscellaneous reviews and workshop costs. The JSA Programs Committee believes that its continuation of support from the Initiatives Fund for this activity is essential to the Lab by enabling ancillary activities that cannot be or are not supported by contract funds, but factor into the overall quality and effectiveness of the primary activity for which these funds are used.

Hampton Roads Economic Impact Study. Since the first quarter assessment, the Wessex Group has completed its analysis of the economic impact of the Lab to the local, regional, state, and national economies. The final report, available on the owner's public web site, has been and will

continue to be used as a resource for increasing the public awareness of the Lab and for support for garnering adequate funding and other resources for the Lab. The JSA owners believe that by quantifying the direct benefits of the Lab in its current state (based on FY2007 data) as well as the benefits brought about with the 12-GeV upgrade, this report is valuable in relaying to non-scientists (many members of funding agencies) the rationale for support for a basic science lab the value of which lies in the long-term scientific contributions that the Lab is expected to make. See also additional information under 4.1.4.

JLab Science Activities for Teachers (JSAT). A companion program to the DOE-funded ACTS program at JLab, JSAT enables an additional 40 teachers per year to participate in an important educational initiative which leverages the talent and expertise of the Lab staff to further the DOE's goal of maintaining the nation's scientific and technological leadership by helping to train and educate the next generation of scientists and engineers. As part of the JSAT program, the Lab's Science Education Office organized the first Teacher Night at Jefferson Lab, an event that drew 165 teachers who spent an evening listening to, learning from, and seeing demonstrations of over 40 JSAT teachers on such science activity topics as: friction, electrolysis, exothermic demos, energy conservation, scientific investigation, and many more. The JSA Programs Committee believes that this initiative brings high value to the Lab leveraging current resources, supports the development of K-12 education in the math and sciences, and builds on the community support and outreach of the Lab. See also additional information under 4.1.4.

Research Internship for Foreign Undergraduates. This is the first year of awards of four internships under this companion program to the DOE-funded Science Undergraduate Laboratory Internship program. Together with the SULI Program, these internships enable a valuable opportunity for interns to experience a true basic science research environment that includes domestic and international peers and mentors. See also additional information under 4.1.4.

JSA Users Activities:

- JSA Postdoctoral Fellowship. The Users Group selected a Temple University-based researcher as the recipient of a research grant to build components of a flash ADC based data acquisition system, a cutting-edge electronics system, that may allow researchers to record five times more data than is currently captured. The system will support the spin asymmetries on the nucleon experiment in Hall C and the d2n experiment in Hall A. The award honors nuclear physics postdoctoral candidates who have a record of accomplishment in physics and whose planned research will have a high impact on the physics program at the Lab.
- Users Group satellite meetings. The first of two satellite meetings of the User Group was held at the American Physical Society spring meeting in April in St. Louis. Initiatives Fund support provides for enhanced communication between the users and the Lab by helping with the costs of room rental, audio-visual equipment rental, and catering.
- Student led tours. Initiatives Fund support is provided to a group of about ten graduate students who are trained by the Lab's Public Affairs Office to assist with and/or give Jefferson Lab tours. In exchange for the experience to the students of speaking to the general public about the Lab, the Lab's Public Affairs Office is bolstered by this additional support as part of its overall public outreach program.
- Workshop on the GlueX Detector at JLab. Along with support from Carnegie Mellon and the Lab, the Initiatives Fund supports the *Photon-hadron physics with the GlueX detector at Jefferson Lab Workshop* held March 6-8. The spokesperson of the GlueX collaboration from Carnegie Mellon, the JLab Hall D group leader, and the founding spokesperson from Indiana University, with several colleagues, organized the meeting, the primary purpose of which was to raise the awareness of the physics possibilities that GlueX will provide and to identify

ways in which new collaborators could make contributions to the experiment. The GlueX experiment is the driving motivation for the 12-GeV upgrade. In addition to strengthening the GlueX collaboration, the JLab user community will include new collaborators in new physics using GlueX. With the 12-GeV project on track to reach CD-3 this fall, this is an opportune time for collaborators to consider the physics program possible within GlueX.

- Hall B, CLAS, Architectural Model. Hall B will require extensive reconfiguration including its equipment as a result of the 12 GeV upgrade. Hall B senior scientists proposed the building of a 1/24 scale model that would help to visualize the changes to the detectors, magnets and supporting infrastructure of this compact, complex geometry. A student intern from a collaborating university (Old Dominion University) was selected to work with Hall B design and technical staff to build the model. In addition to using the model to plan the staging and installation sequences of the equipment and to explain the changes to the user community and the general public, this initiative provides a student intern, under the guidance of trained JLab staff, to experience the research activities of the Lab.

Recruitment Activities. Initiatives Fund supports certain recruitment costs related to the hire of the new Lab Director.

JSA corporate continued to provide its self assessment of performance on its annual commitment of \$0.5 million Initiatives Fund support regularly throughout the fiscal year. In addition, the owner's Chief of Strategic Services met regularly with members of TJSO during the performance period to ensure that questions regarding the Initiatives Fund as well as requests by the TSJO for ad hoc reports were answered in a reasonable and timely manner.

To address the Site Office feedback to the 1st quarter performance assessment regarding the suggestion to involve Laboratory senior management in the decision making on the Initiatives Fund, JSA is pleased to have had the opportunity to discuss with the Site Office Manager on April 8, the selection process for the current year Initiatives Fund awards, including the involvement of senior Lab management. The JSA Programs Committee intends to continue to include representation of senior Lab management, as well as Users Group representation, in assessing the value of proposals seeking Initiatives Fund support in a fair and objective process. Notwithstanding the misinformation that prompted this feedback, the JSA Programs Committee is committed to improving the communication regarding the request of proposal process in the future, as well as improving the communication about the specific programs, initiatives, and activities supported by the Initiatives Fund. To this end, the JSA Programs Committee in a meeting held in April 2008, approved a draft request for proposal process for the next fiscal year which the Committee believes will address the concerns noted by the TJSO.

The DOE accepted JSA's commitment to provide \$250,000 per year to manage and support a relations and outreach program that supports science in general and the Lab and its related and complementary activities in particular. To address the Site Office feedback, both in its FY2007 evaluation and in the 1st quarter FY2008 feedback, JSA assigned the owner's Chief of Strategic Services to meet regularly with the TJSO to keep the Site Office apprised of status of the relations and outreach program and efforts.

JSA completely revised the Initiatives Fund web site to provide information about the Program readily to the general public as well as all current PI's. This web site revision was in anticipation of the FY2009 Call for Proposal.

Of the twenty-two FY2008 IF projects, eight projects have completion dates in FY2009 and fourteen projects have been closed out, including two projects (patent awards and Users Group relations building activities) which have been cancelled due to no activity in FY2008. As requested, a more detailed report

has been provided to the Site Office regarding the FY2008 Initiatives Fund Program. Upon the completion of year-end close-out, the IF website at <http://www.jsallc.org/IF/IFIndex.html> will be updated to include FY2008 projects status.

Twenty-two proposals were received at the end of this quarter in response to the July 10, 2008 Call for FY2009 Initiatives Fund Proposals. A Board-appointed 2009 IF Evaluation Committee will review these proposals and the six historical IF funded programs and make its recommendations to the JSA Programs Committee in November. Following the Programs Committee's review, recommendations will be made to the JSA owners in regards to the FY2009 awards.

In addition to the assessment provided under 4.3.1 addressing JSA's provision of additional resources including reach back through its owners and Board and Committee members, and the assessment provided in 4.1.4 addressing JSA's support to raise the public awareness of the Lab, during this performance period, the following activities and efforts were undertaken by the contractor as part of its relations and outreach program.

- The corporate owner coordinated meetings for the Lab Director with key congressional staffers to address funding for nuclear physics, the 12-GeV upgrade project, and the free electron laser program.
- The corporate owner coordinated meetings for the FEL Associate Director with congressional staffers to address funding request for the free electron laser program.
- The corporate owner coordinated the visit of Representative Wittman to the Lab in January.
- The corporate owner hosted the state legislative reception in Richmond in January through the Greater Richmond Technology Council, attended by the Lab Director.
- In support letters to 16 Virginia Senate Finance Committee members and 24 Virginia House Appropriations Committee members, 10 Virginia Senators and Delegates on the budget conference committee, the corporate owner strategically referred to the findings from the economic impact study (see information under 4.1.4 and above in this section 4.3.3 regarding the Wessex Group report) to make a strong case for State support for the 12-GeV upgrade project during the budget conference process.
- Director Jerry Draayer was among the JSA leaders who participated in Governor Kaine's visit to the Lab in March. Accompanying the Governor in his first visit to the Lab site was the Chair of the Board of the majority owner of JSA (SURA) who is the Provost of the College of William & Mary.
- The corporate owner continues to work through the Task Force on the Future of American Innovation for emergency funding for science in support of the American Competitiveness Initiative and the America Competes Act. These additional FY08 funds of \$250 Million for the Office of Science would forestall the most severe of science cuts and negative impact, having significant impact on the national lab system.
- The corporate owner continues to work through the Energy Sciences Coalition to support the President's FY2009 budget request incorporating the Lab's request which represents a 28% increase over current year. Sixty-eight signatories, including those of Virginia Senator Warner and Virginia Senator Webb, have been secured for a letter of support to fund the Office of Science at the requested \$4.722 billion level. The letter was forwarded in March to the Senate Appropriations Committee in anticipation of its budget deliberations.
- In March, as part of the relations strategy, the JSA President provided written testimony to the Appropriations Subcommittee Committee regarding FY2009 funding priorities, in support of the Office of Science and particularly its nuclear physics program.
- In March, the corporate owner met with corporate representatives from other Labs and other federal relations representatives, prior to a Lab Directors' meeting with the Under Secretary on April 1, to discuss building the political coalition to support the President's FY2009 budget request.

- JSA owner presented the 2007 SURA Distinguished Friend of Science Award to the honorable Senator John Warner. Senator Warner was recognized for his extraordinary efforts in the southeast to strengthen the scientific and technical capability of the region and nation, including his longstanding support in Congress for the Lab (<http://www.sura.org/news/docs/WarnerAward.pdf>). JSA Board Directors, Hampton University President William Harvey and University of Virginia President John Casteen, co-chairs of the JSA Relations and Outreach Committee, both expressed the Senator's deserving recognition for his allegiance to the Lab and his advocacy of the nation's scientific and educational agenda. The inaugural Distinguished Friend of Science Award was presented in 2006 to the honorable Senator Lamar Alexander. The purpose of the award is not only to recognize individuals who have worked to support the SURA mission of enhancing the research capacity in the region and nation, but to bring recognition to the critically important science agenda and its public impact. Both awardees have been champions of increasing DOE's Office of Science funding and supportive of the PACE (Protecting America's Competitive Edge) legislation, the American Competitiveness Act, and the recommendations of the *Rising Storm* report. JSA believes that its duty to be a good corporate citizen and responsible steward of the Lab requires that its members and owners participate in public debate and advocacy that will inform and sustain policy discussion to support the advancement of science and building our nation's research capacity.



SURA President & CEO Jerry Draayer presents the 2007 Distinguished Friend of Science Award to U.S. Senator John Warner of Virginia in his office, with Greg Kubiak, SURA Chief Communications Officer.

As mentioned in 4.1.1 addressing an effective relations strategy that supports the Lab's vision, these activities are part of the contractor's ongoing relations and outreach program, a program which seeks to establish the long-term relationship necessary to continue the strong support from the local, state, and national communities that it was garnered. Efforts, including those of prior years by the contractor, have resulted in the following current successes:

- Department of Defense Appropriations in FY2008 of \$3.6 million for the Free Electron Laser program, including \$2.0 million from the Office of Naval Research and \$1.6 million from the Air Force.
- State funding for the 2007-2008 period including \$.5 million for the 12-GeV upgrade, in addition to \$1 million in general appropriations for Governor's Distinguished CEBAF Professorships, Governor's CEBAF Scientists positions and for industry-led research that promote economic development opportunities in the state. As a direct result of the contractor's relations and outreach efforts, the state's general appropriations for the next biennium (2008-2010) is a \$.5 million increase per year over current yearly funding (\$1.5 million/per year). The Commonwealth of Virginia has funded over \$27 million since the inception of the JLab project. This includes one-time funding of \$5 million for the free electron laser program in the mid-1990's.
- Additionally and resulting directly from the contractor's relations program, the Commonwealth of Virginia included in the last year of the next biennium (2009-2010) \$6.0 million for the 12-GeV upgrade project.
- JSA owner continues its relations building with congressional staff and the Virginia delegation to support adequate funding for the 12-GeV upgrade project construction start and the FEL program. JSA facilitated meetings with state budget staffers in its ongoing effort to ensure that the Commonwealth of Virginia recognized the benefits of the Lab for the contributions it had made over the past decades.

- JSA owner joined with the Energy Sciences Coalition to support basic science research funding of the new administration (<http://www.sura.org/news/docs/ESCPR091708.pdf>) in a September petition. Continuing its participation with and support of the Task Force for the Future of American Innovation, the JSA owner urged full funding of the America Competes legislation for FY2009 (<http://www.sura.org/news/docs/TFFAISenateCR.pdf>).

JLab Insight : JSA's corporate commitment to provide a suite of technology tools and business management processes that integrate laboratory management data and provide DOE 24/7 insight into laboratory performance through a secure web-based portal was fully implemented in FY07 via JLab Insight. During this performance period, the Lab has worked to further enhance the functionality and effectiveness of the system by adding a "Financial" tab for easy access to financial management reports and continuing development and population of the "Performance" tab with timely data for DOE and JLab management on PEMP Metrics, Key Performance Indicators and other meaningful performance reports.

Some of the benefits of Insight to date include:

- Provides tool to measure performance, track against and benchmark DOE goals, and make quick corrections as necessary.
- Simplifies and facilitates DOE oversight.
- Provides current data on key performance goals/metrics/milestones/indicators.
- Complies with DOE order 226.1 "Implementation of DOE Oversight Policy".
- Facilitates continuous improvement through issues management, audits and assessments, and lessons learned.
- Benchmarks well against SC requirement to improve Laboratory business processes.
- CSC support available for life of contract.

Skillport: In FY07 CSC's Advanced Technology Division, on behalf of JSA and its proposal commitment, negotiated a license and purchase order to support 400+ seats in Skillport and committed up to \$30,000 annually to provide distance learning for laboratory employees in topics related to efficient and effective management of Government contracts and resources. To date, a total of 86 seats are available and 74 have been assigned to JLab staff. More seats will be obtained when all 86 have been assigned. During FY08, 187 classes have been completed. These classes are taken at no cost to JLab and represent a significant cost savings/avoidance by eliminating class registration fees and travel. The easy accessibility to Skillport also allows our staff to take courses after work and on the weekends if they chose, which helps reduce time away from work for training.

In addition to these contractual obligations, the corporate owner has contributed the following to Jefferson Lab:

- As a result of the relationship built by the contractor over the years as part of its relations and outreach program, the Commonwealth of Virginia continues to contribute facilities (VARC building and land). JSA subleases a building and land at no cost to the DOE for use by Lab staff. The building houses several administrative functions as well as the Lab's education and outreach group. It provides much needed office and meeting space for Lab staff and education and outreach activities. Estimated value of the contributed facilities is \$475K.
- Since the mid-1980's, the Commonwealth of Virginia, through the College of William and Mary, has contributed personnel (originally 17.5 positions in 1985, currently 11 positions) assigned to the Lab. These positions are primarily administrative in nature and they represent supplemental support from non-DOE funds for administrative Lab functions including finance, information technology services, procurement, facilities management, etc. The securing and maintaining of

these positions as a contribution to the Lab workforce results from the contractor's overall relations program. Estimated value of contributed personnel is \$743K.

- The corporate owner provides support for the fiscal activities related to workshops and conferences held at the Lab, including the deposit of collected registration fees and other revenues, and payment of invoices for meeting expenditures. Transactions in which the corporate owner provided this fiscal support during this performance period relate to the following meetings: DNP 2007 (October 2007), Workshop on Exclusive Reactions at High Momentum Transfer (May 2007), CLAS 12 Rich Detector Workshop (January 2008), DOE Business Managers Meeting (April 2008), and Photon Hadron Physics with the GlueX Detector (March 2008); DOE Networking Security Monitoring Technical Summit (May 2008); DOE Contractors Accounting Officers Meeting (May 2008); Electron Ion Collider Workshop (May 2008); DOE Accelerator Safety Workshop (August 2008); TF-SRF Workshop (July 2008); Electronic Commerce Vendor Show (September 2008).
- The corporate owner continues to make available the 42-room SURA Residence Facility, owned, managed and operated by the owner, for on-site accommodations for Lab researchers, guests, collaborators, and vendors. With a staff of five FTE's and additional seasonal staff to meet peak demands and outsourced service support, the objective is to manage this operation on a break-even basis. However, in order to maintain an affordable and competitive rate schedule, the owner has historically, and again in this performance period, subsidized the operations. The SURA Residence Facility is the preferred choice of many Lab visitors, both short- and long-term. Feedback continues to substantiate that Lab users consider the location and services of the Facility to be part of their entire Lab experience.
- The corporate owner sponsored the *Enabling Grand Challenge Science: the Light Source of the Future Workshop* with Louisiana State University and Florida State University in January 2008. This workshop was intended to begin discussions among the regional scientific community about "the enormous diversity of possible next generation light sources and how they can be used to understand the science articulated by the NAS and DOE in their proposed Grand Challenges." See also additional information under 4.2.1.
- The corporate owner continues to provide support to the Lab's technology transfer and commercialization program with subject matter expertise, financial support, and accessibility to venues where JLab technology can be showcased. See also additional information under 4.1.3.
- During FY2008, the corporate owners contributed about \$120K for various JLab-related activities that occurred during and supported an effective leadership (director) transition. The TJSO has been apprised during regular communications of the specifics of these activities.

Table 13. Goal 4.0 Performance Rating Development

ELEMENT	Letter Grade	Numerical Score	Objective Weight	Total Points	Total Points
4.0 Provide Sound and Competent Leadership and Stewardship of the Laboratory					
4.1 Provide a Distinctive Vision for the Laboratory and an Effective Plan for Accomplishment of the Vision to include Strong Partnerships Required to Carry Out those Plans.	A	3.9	30%	1.17	
4.2 Provide for Responsive and Accountable Leadership throughout the Organization	A-	3.7	35%	1.30	
4.3 Provide Efficient and Effective Corporate Support	A	3.8	35%	1.33	
Performance Goal 4.0 Total					3.80

Table 14. Goal 4.0 Final Letter Grade

Total Score	4.3-4.1	4.0-3.8	3.7-3.5	3.4-3.1	3.0-2.8	2.7-2.5	2.4-2.1	2.0-1.8	1.7-1.1	1.0-0.8	0.7-0
Final Grade	A+	A	A-	B+	B	B-	C+	C	C-	D	F

Goal 5 Sustain Excellence and Enhance Effectiveness of Integrated Safety, Health, and Environmental Protection

Goal Requirement:

The Contractor shall sustain excellence and enhance effectiveness of integrated safety, health, and environmental protection. (The goal shall measure the Contractor's overall success in preventing worker injury and illness; implement ISM down through and across the organization; and provide effective and efficient waste management, minimization, and pollution prevention.)

Objective 5.1 Provide a Work Environment that Protects Workers and the Environment

Measure 5.1.1 Requirement: The Contractor's progress in achieving and maintaining "best-in-class" ES&H program performance as measured by the day away, restricted or transferred (DART) case rate.

TARGET: DART Rate = 0.25.

JSA Performance:

DART Rate = 0.33

JLab employees and subcontractors experienced two recordable injuries that resulted in lost or restricted time. The first was a strained back that resulted in two restricted days. This case was originally determined to be non-recordable, based upon a misunderstanding of the classification criteria. It was discovered during the DOE-HSS review and the error was rectified. The recently hired ES&H Reporting Officer, who makes the final classification designation, has received training to assure the potential for future errors has been minimized. The second injury, occurring at the end of the performance period, involved an employee getting his finger pinched between two shielding blocks. The injury was severe enough to warrant reporting through the ORPS and NTS system, in addition to the CAIRS system. Corrective actions are currently in progress.

Based upon the hours worked, this equates to a DART case rate of 0.33, slightly higher than the B+ target. Although this number is greater than the B+ target, it should be noted that JLab also worked 683 days without an injury resulting in lost time.

In addition to the injuries discussed above, a subcontractor employee received a hand injury. Since the contractor had less than 11 employees, it was entered into the DOE system as a non-recordable injury; nonetheless, the injury was investigated and corrective actions taken to prevent recurrence.

The Lab received congratulations from Ray Orbach on February 20, 2008 in regards to these accomplishments – *“I am proud of the record of safety improvements at TJNAF. I think it is remarkable that between fiscal years 2002 and 2007, Jefferson’s DART rate dropped 83%. On top of that, Jefferson Laboratory has not had a DART case since November 3, 2006.”*

JLab’s ISMS Program Description was submitted for approval December 20, 2007 and included extensive feedback from self assessments, independent assessments, and staff resulting in an improved program description over previous annual submissions. JLab developed and implemented a comprehensive plan to achieve excellent ratings during the OIO review of the ISM program; the plan was project based with a detailed Work Breakdown Schedule with about 500 individual tasks. Most noteworthy is that it has been principally developed and implemented by the JLab workers thru the Workers Safety Committee and core teams made up primarily of workers from all areas of the Lab. Every member of the staff and user community received Integrated Safety Management Awareness training. The Lab also took advantage of lessons learned and conducted extent of condition analysis from other Labs who have recently gone thru the review to ensure the same deficiencies are not discovered at JLab.

In ongoing efforts to continually improve safety and to prepare for the DOE-HSS Integrated Safety Management Review, JLab developed a new Integrated Safety Management webpage. This webpage provides a platform for sharing ISM-related documents, tools and processes that are being used across the Lab to accomplish the goals of ISM. A unique feature of the site – the ISM Thought of the Day – provides a new message daily that can be used to advance safety discussions in meetings or to provide a safety message to reflect or act on daily.

The Integrated Safety Management review was held June 2 – 13, 2008 and JLab received high marks (effective performance rating) in 11 of 13 categories. The seven-member inspection team reviewed four areas of the Lab’s operations including feedback and improvement processes, the Free Electron Laser, the Test Lab, and Facilities Management and Logistics. Thomas Staker, director of DOE’s Environment, Safety and Health Evaluations, noted that his office inspected eight nanotechnology facilities at other labs and that JLab’s was *“among the best.”* He also noted that the Lab’s Subcontracting Officer’s Technical Representatives (SOTR) were *“among the best we’ve seen in the DOE complex.”* Positive attributes cited by the inspection team include:

- Laser hazard for FEL work activities are well characterized and controlled.

- The Test Lab has a comprehensive and proactive safety program in place for its use of acids.
- Hazards associated with nanomaterial research at FEL are effectively mitigated through application of appropriate engineering controls, along with development and implementation of conservative administrative controls and PPE consistent with the NSRC Approach document.
- Facilities Management and Logistics SOTRs are very experienced, knowledgeable, and effectively engaged in reviewing subcontractor performance and ensuring that JLab requirements are met during maintenance activities.
- TJSO has substantially improved its staff capability and processes to provide effective oversight of ES&H performance at JLab.

Although the report was overwhelmingly positive, three weaknesses were identified → Site forklift operations and training do not meet several Worker Safety and Health Program Rule (10 CFR 851) and ES&H Manual requirements have increased the risk of a serious incident; JLab feedback and continuous improvement processes are not fully effective; and TJSO oversight of contractor and site office corrective action management has not been fully effective. Four High Performance Work Teams (HPWT) were formed in response to these findings and a corrective action plan addressing these findings was submitted to TJSO for

approval on October 10th, three weeks ahead of schedule. The table below reflects the status of the four areas that were reviewed. The ratings and associated management responses are Effective Performance (GREEN), Needs Improvement (YELLOW), and Significant Weakness (RED).

Work Planning and Control				
ACTIVITY	CORE FUNCTION RATINGS			
	Core Function #1 – Define the Scope of Work	Core Function #2 – Analyze the Hazards	Core Function #3 – Develop and Implement Controls	Core Function #4 – Perform Work Within Controls
Free Electron Laser	Effective Performance	Effective Performance	Needs Improvement	Effective Performance
Test Laboratory	Effective Performance	Effective Performance	Effective Performance	Effective Performance
Facilities Management & Logistics	Effective Performance	Effective Performance	Effective Performance	Effective Performance

Feedback and Continuous Improvement - Core Function #5	
TJSO Feedback and Continuous Improvement Processes	Effective Performance
TJNAF Feedback and Continuous Improvement Processes	Needs Improvement

TJSO Mid-Year Feedback → *Very good progress is being made in advancing the lab's ISM program.*

TJSO Mid-Year Feedback → *Management and staff attention to safety in the work place is noted and is also reflected in the illness and injury statistics. The laboratory will need to consider the HSS comments from their assessment of the CAIRS program, including incident classifications.*

TJSO 3rd Quarter Feedback → *The June HSS ES&H inspection tentatively identified 4 findings and a number of OFIs; with the Laboratory achieving Effective Performance in 11 of the 13 areas and a number of positive attributes. No other comments at this time.*

Measure 5.1.2 Requirement: The Contractor's progress in achieving and maintaining "best-in-class" ES&H program performance as measured by the total reportable case rate (TRCR).

TARGET: TRCR Rate = 0.65.

JSA Performance:

TRCR Rate = 0.33

See Measure 5.1.1 for additional performance data.

Measure 5.1.3 Requirement: 100% of all jobs for which the projected collective Total Effective Dose Equivalent (TEDE) exceeds 100 mrem per Job Specific RWP are reviewed (pre and post job) by a radiological engineer for ALARA considerations. 90% of jobs for which a Job Specific RWP is generated where the collective TEDE does not exceed 100 mrem are reviewed (pre and post task) by a radiological engineer for ALARA considerations.

TARGET: 100% of all jobs for which the projected TEDE exceeds 100 mrem per Job Specific RWP are reviewed (pre and post job) by a radiological engineer for ALARA considerations. 90% of jobs for which a Job Specific RWP is generated where the collective TEDE does not exceed 100 mrem are reviewed (pre and post job) by a radiological engineer for ALARA considerations. Targeted to be within 30 days of RWP close-out. Document that these reviews are conducted in docushare or equivalent. Submit revised RPP and implementation plan by January 4, 2008.

JSA Performance:

There were a total of nineteen RWPs completed during this performance period. Six were in the <100 mrem estimate category (Hall C target platform work, Hall A target re-work, Hall C target reconfiguration) and ten were in the >100 mrem estimate category (Hall A dump tunnel wall sealing, Hall A ion chamber replacement, Hall C leak checks, Hall C exit spool piece reworked, Hall C exit beamline, Hall C experiment reconfiguration, Hall A target reconfiguration). All received the appropriate radiological engineer reviews within 30 days of the RWP closeout and all are posted on docushare. For those RWP's and personnel exceeding 100 mrem, none were above the estimates of total dose called out in initial work planning. In addition, the revised Radiation Protection Plan (RPP) was submitted to TJSO on January 4, 2008 and as stipulated above, contained an implementation plan of the new requirements in 10CFR835. A Corrective Action Plan was developed following the FY07 Radcon Peer Review that was held in September 2007. The review committee identified 11 findings; nine have been completed and two remain for completion in FY09. In addition, FY08 Dosimetry results for JLab did not exceed the administrative control levels.

FY08 Challenges:

- FY07 DOE Evaluation Report → *The cumulative dose for the Laboratory workforce was down for the calendar year 2006, relative to the previous year; furthermore the off-site radiation dose estimate for the most recent Rad NESHAP report was likewise down from the previous year. These positive program trends are tempered by some of the negative issues that were identified as a result of investigations stemming from the July 2006 Price Anderson Amendment Act (PAAA) NTS entry. One of more disconcerting issues revealed from the causal factor investigation was the inability to determine the Radiation Work Permit (RWP) under which beam viewer plates were removed. The accelerator location in which this equipment was located/removed is in an area of relatively high dose fields and radiological contamination concerns, thus warranting a task specific RWP. No such RWPS were identified for this work during the estimated dates in which this equipment was removed*

from the accelerator. The Department is expectant that the pre and post job reviews identified in this PEMP measure not focus solely on the ALARA aspects of the work. In order to meet these expectations, the Contractor must do a much more thorough job of reviewing the radiological work, and the corresponding documentation. The Department's review of the RWPs generated during the rating period revealed some inconsistencies in recording work authorizations and general records management. Attention to details is very important in managing these records. The importance of quality records becomes evident when trying to accurately reconstruct worker dose estimates, such as that being currently undertaken by the Radiation Control Group. Overall the Department was impressed by the conduct of the Radiological Work Stand-down that was conducted in response to the radiological material control events. It was insightful to hear feedback from the workforce during the Stand-down. The lab will need to give priority attention to address the lack of familiarity of some staff have on the correct process to handle materials being removed from the accelerator and end stations. The information provided in the Stand-down and other program awareness initiatives are hoped to rectify this situation.

Status: A number of corrective actions were taken to address the above issues. All radiation workers and their supervisors were sensitized to the correct process in handling radioactive material during the safety stand-down. Radiation Worker training was modified to emphasize aspects of radioactive material handling and control. Possibility of using active devices at hall and accelerator exits were investigated and rejected due to technical considerations. However, accelerator operators were retrained to explicitly ask questions when workers are exiting after controlled access. Also, ARMs were asked to be more vigilant when accompanying radiation workers who perform urgent repairs. Attention to managing and moving potentially activated material was also added to the Safety Warden Checklist. RadCon Department revised its RWP procedure and all RCTs received training on this change. A complete list of corrective actions relevant to this issue can be found in the CAT System under RDR-2007-05-01 to -12.

Measure 5.1.4 Requirement: Number of environmental incidents resulting in administrative or technical permit violations: 1 administrative, 0 technical permit violations. Apply causal analysis principals to environmental incidents if one occurs in this period.

Note: Administrative and technical violations are those issued by the regulatory agency.

TARGET: 1 administrative, 0 technical permit violations.

JSA Performance:

There have been no environmental incidents resulting in Administrative or Technical Permit Violations during this performance reporting period, and more significantly there have been no incidents since the start of the new contract with JSA. Four minor environmental events (none with any environmental regulatory impacts) during the 1st quarter received event investigation including causal analysis. JLab had a December 21st Virginia Department of Environmental Quality (DEQ) review for the Lab's application for the Virginia Environmental Excellence Program. This DEQ program recognizes organizations that have outstanding regulatory compliance records and have made environmental stewardship enhancements. Participation in this program provides discounts on environmental permit renewal. The Lab received notification of acceptance into the program on January 25th.

JLab was one of five laboratories selected to receive DOE's 2007 "Best in Class" award for pollution prevention. The Lab was recognized for the installation and use of the Quad Core Cluster Computer. As mentioned in Objective 1.4, the supercomputer dubbed "7N" runs powerful computer simulations to shed light on how one of the basic forces of nature, the strong force, builds protons, neutrons and other

particles from the basic building blocks of matter: quarks and gluons. The switch to quad cores also made for a more eco-friendly cluster. The cluster consumes about 20 percent less power than it would have had it been assembled with dual cores. It also functions more than twice as fast as the dual cores, due to the extra two cores on each processor and changes in the internal architecture of the chips. JLab has been nominated for the 2008 White House Closing the Circle Award competition and will also be considered for DOE's *Pollution Prevention Stars Award*.

The ES&H division received recognition from the TJSO for their assistance in reviewing and commenting on the Environmental Authorization Subject Area. ES&H also responded to a request from TJSO to assist in the implementation of DOE's Environmental Justice Strategy by providing information on the Lab's current, planned, or potential environmental justice activities; the list was submitted to TJSO on September 20, 2008.

TJSO Mid-Year Feedback → Compliance with environmental permits is evidenced by outcomes of walkthroughs. Improvement in the preparation of corrective action plans is noted. Regular meetings with the contractor environmental engineer and Radiation Control Manager are scheduled at their request and provide necessary feedback and continuous improvement loop. Contractor environmental engineer provides monthly activity schedule to the Site Office, evidence of attention to detail which is key in maintaining environmental permit compliance.

Opportunity for Improvement:

- TJSO Mid-Year Feedback → *Jefferson Lab's submittal of environmental permit required sampling reports have been too close to the reporting deadlines to allow sufficient time for thorough TJSO review (i.e., submission of quarterly Discharge Monitoring Report for groundwater wells required by VA0089320 Virginia Pollutant Discharge Elimination System). The Laboratory is requested to review the timeliness associated with submittal of regulatory-driven documents to ensure sufficient time is allowed for TJSO review. The Laboratory continues to provide a work environment protective of workers and the environment as evidenced by the management and workers actions and performance.*

Status: JSA's subcontracted laboratory normally provides analytical results for this permit on a timely basis, which usually enables information to be provided to the Site Office to allow adequate review time. Over this fiscal year, in two cases, the subcontractor did not take the required sample until the end of the reporting period. Analytical results are then not available to JSA until all analysis is completed. JSA raised the concern with the subcontractor, who assured JSA that this permit-required sampling would be performed in a timelier manner in the future. JSA has tried to mitigate this issue by providing TJSO with other relevant information, allowing for adequate review time.

Objective 5.2 Provide Efficient and Effective Implementation of Integrated Safety, Health and Environment Management

Objective Requirement:

In measuring the performance of this objective the DOE evaluator(s) shall consider the following:

- The maintenance and appropriate utilization of hazard identification, prevention, and control processes/activities; and
- An open reporting culture is maintained at the Laboratory while appropriately responding to ESH&Q incidents/emergencies

- Identification of root causes to ES&H non-compliances and implementation of corrective actions
- Extent of the Laboratory's participation in working with other SC Laboratories or other entities/organizations outside SC in both giving and receiving external safety program audits as to advance staff skills and facilitate the sharing of lessons learned.

Measure 5.2.1 Requirement: Number of Management Self Assessments (MSAs) conducted and reviewed and accepted by ESH&Q Division. The number of Independent Assessments (IAs) completed.

TARGET: MSAs and IAs Completed - 100% of number of MSAs conducted and reviewed and accepted by ESH&Q. IAs Completed = 100% - of number scheduled are completed. Completed means IAs are conducted and draft reports are written. At least 30% of major division groups participate (FEL, Engineering, Physics, Accelerator and Facilities Management). Evidence of timely closure with verification for all ORPS, NTS, MSAs, IAs, and external assessments with Significance Level of 3 or higher.

JSA Performance:

In the 1st quarter, an MSA of the TJNAF Contractor Assurance Program was completed with two noteworthy practices identified and a Cyber Security IA was completed with one noted Best Practice identified. The Calibre ISMS Preparation IA began on time in the 1st quarter and continued during the 2nd quarter. Significant progress has been made to date and this assessment was completed June 30, 2008. There were no Significance Category 3 corrective actions due in the 1st quarter.

In the 2nd quarter, JLab submitted to the TJSO a revised Integrated Assessment schedule which included the addition of one MSA and one IA. The JLab Statement of Work Preparation (MSA) was requested by the 12 GeV Division and the ISMS Assessments in FEL and Physics (IA) were requested in preparation for the HSS assessment of JLab's ISMS program in the 3rd quarter. The Installation and Test MSA originally scheduled for completion in the 3rd quarter was moved to the 2nd quarter and began on schedule March 10, 2008; it was completed in April 2008. The Environmental Management System IA scheduled to begin in the 2nd quarter has been deferred until FY09. There was one level 3 corrective action which was completed ahead of schedule during the 2nd quarter. In addition, there are no open FY07 level 3 corrective actions.

The total committed number of assessments was successfully completed in FY08. A total of eleven MSAs were conducted throughout the year, six more than the five planned MSAs. Seven IAs were completed. One IA, Confined Space Entry, was not completed and deferred to the first quarter of FY09. One IA, ISMS IA (by PEC) was canceled by senior Laboratory management. Two additional IAs were completed to replace the two that were removed from the schedule.

Four ORPS entries were made during the 4th quarter. Each involved a notable event. Trends seen from the data include communication and awareness of configuration control. Site-wide corrective actions have been entered into CATS.

Two NTS items, Pressure Safety and Material Handling, were completed during this reporting period. All corrective actions were closed in JLab's CATS system as well as the DOE's NTS system. Objective evidence was provided to DOE HQ via TJSO.

Additional assessment performance occurring during this performance period include QACI follow-up on Rigging and Material Handling assessment report with the affected parties to assure completion of CAP/CATS actions entry; monitored DOE O 226.1 CAS CAP CATS actions (IA-2007-59) progress and

report/update; integrated Safeguards & Security Program assessment (226.1); and resolved performance issues with Installation and Test MSAs.

TJSO Mid-Year Feedback → *JSA committed to performing 4 MSA's and 3 independent assessments at the beginning of FY09. JSA write-up noted that 2 MSA's and 4 IA's were conducted, thus JSA is on target to complete the number of reviews they committed to.*

Opportunity for Improvement:

- TJSO Mid-Year Feedback → *Despite a general absence of significance category 3 issues needing to be managed, there have been instance where ORPS determinations and/or issue management were not executed in a timely fashion (SCI shackles identified from Jan 2008 DOE Rigging and Material Handling Surveillance; corrective actions resulting from March 2008 HEPA vacuum investigation). It is important that the Laboratory use their internal programs and procedures to classify events to maintain compliance with DOE's ES&H reporting requirements, and manage/track any associated investigations and corrective actions.*

Status: JLab's response to the HSS review will assure improvement to our processes that assure events are classified in a timely manner and results of investigation are appropriately tracked in CATS. ORPS determination and inputs were addressed with two significant actions:

- 1) A replacement Compliance and Reporting Officer was hired on 1 July 2008; this will alleviate resource issues since the retirement of the previous position holder. Primary duties of this position include DOE to JSA liaison with respect to ORPS reportable events, as well as COE/Lessons Learned Coordination.
 - 2) This concern was identified as finding D4, Event Investigation and Reporting, in the recent HSS Independent Oversight. Procedural improvements and submission input clarifications have been implemented over the past quarter; additionally, a High Performance Work Team has been commissioned to address all facets of this issue, including DOE concerns of ORPS applicability, event identification, investigation and submission timeliness. All corrective actions will be CATS items and included with the HSS Corrective Action Plan.
- TJSO Mid-Year Feedback → *TJNAF submitted an ISM declaration with supporting effectiveness review on March 3, 2008. DOE provided feedback as to the quality of the submittal via letter dated March 27, 2008. The site office is expecting the next declaration (with supporting effectiveness review), due August 15, 2008, to adequately address the expectations laid out in DOE's March 27 letter.*

Status: The declaration submitted on August 12, 2008 addressed the issues identified by TJSO's letter.

Measure 5.2.2 Requirement: Maintain an open reporting culture through an established employee concerns program, infusing management expectations in performance appraisals, conducting Director's Safety Council and Worker Safety Committees, providing training, and rewarding performance.

TARGET: Every six weeks hold rotating senior JSA/TJSO safety focus meetings with Laboratory Director, COO, Chief Scientist, Accelerator Representative, Physics Representative, Engineering Representative, FEL Representative, ESH&Q and Facilities Management. Evaluate and trend employee concerns. The Worker's Safety Committee is actively engaged in improving

laboratory safety and conducts at least quarterly employee led Worker Safety Committee meeting with the Laboratory Director and COO. Efforts to continue activities promoting safety culture improvement will be evident.

JSA Performance:

There were seven rotating senior JSA/TJSO safety focus meetings conducted during this performance period. The goal calls for a meeting to be held around every six weeks which equates to approximately two meetings per quarter. Due to extensive travel schedules of those involved, there were no senior JSA/TJSO safety focus meetings held during the 1st quarter. There were two conducted in the 2nd quarter and three conducted in the 3rd and 4th quarter. Attendees at the meetings depended upon the agenda established.

There were eleven Worker Safety Committee (WSC) meetings held during FY08 which is significantly higher than the quarterly goal. In addition, the Chair of the WSC attended the Directors Safety Council meeting to present an issue of concern arising out of the WSC meetings. The Lab Director attended 10 of these meetings, as did the COO. The WSC was extensively involved in the preparation activities for the DOE-HSS assessment. The participation of the employees in assessing the state of ISM at JLab, sharing findings with senior management, and becoming intimately involved in the corrective actions resulted in a very successful assessment. The work planning tool developed by the employees resulted in employees better able to plan their work, as well as explain to the assessors how they were confident they were able to work safely. JLab took a big step in establishing an employee – driven, management –supported, integrated ES&H program and seeks to continue this forward progress in FY09.

Performance improvement initiatives to promote the Lab's safety culture include formal process improvement and documentation of Work Planning and Control, Document Management, and Feedback and Improvement. JLab implemented a web-based Lessons Learned Program (<http://coe.jlab.org/ll/>) in early June. The site is similar to others throughout the Department of Energy complex, allowing each lab or facility a central location for researching safety topics while conducting work planning or task hazard analysis. The Lessons Learned Center contains information on a broad range of topics, including Chemical Management, Personnel Protective Equipment, Radiological Control and Pressurized Systems. This information is gathered from sources both internal and external to the DOE complex, with the overall goal of providing valuable information that JLab can use to plan and conduct safer, more efficient work. The Lessons Learned Center is administered by ESH&Q and many useful inputs come from across the JLab campus. Divisional Lessons Learned Coordinators solicit and distribute relevant information and once a lesson is put into the system, they and the designated Subject Matter Experts (SME's) receive automatic emails distributing the information throughout the Lab. The DOE-HSS assessment found the program to be acceptable.

Opportunity for Improvement:

- TJSO Mid-Year Feedback → *Through a combination of meeting attendance, and review of the minutes generated from the Laboratory's safety related committee meetings, the issues being addressed and actions being tracked appear to reflect a wide range of contemporary challenges, satisfying the intent of this measure. The TJNAF/TJSO safety focus meetings provide a valuable and productive forum to address safety; TJNAF line management attendance (as specified in the measure) at these meetings would enhance their value and lab performance on this measure. The end-of-year report should address the target of "Evaluate and trend employee concerns".*

Status: A new ESH&Q Reporting Officer joined the Laboratory in July 2008. He was assigned the responsibility of performing a quarterly trending analysis. Collating the data available within

CATS, Safety Observations, Safety Warden inspections, Notable Events, and the FM&L Work Order system, he analyzed the information for trends to be brought to management attention. The results of the first trending exercise were presented to the Director's Safety Council in August 2008. It was well received and decisions made on addressing potential for slips in building entry and exit ways, along with a commitment to develop corrective actions that consider the breadth of the Laboratory. The results of the trending analysis was shared with TJSO in the September 2008 meeting as well. This exercise will continue quarterly.

Measure 5.2.3 Requirement: Implement the pressure safety requirements of 10CFR851 in accordance with the JLab non-compliance tracking system (NTS) submittal.

TARGET: Complete all actions as scheduled in the NTS submittal for pressure safety implementation.

JSA Performance:

There are seven corrective actions on the DOE NTS submittal for pressure safety implementation. All were loaded into CATS. Three were completed during FY07 and four remained for completion in FY08:

1) Address procedural inadequacies to ensure pressure vessel safety requirements of 10CFR851 are institutionalized (completed October 29, 2007); 2) Establish qualification standard for personnel that design/fabricate/test/inspect/repair and operate pressure systems (completed October 29, 2007); 3) Evaluate and provide training on new/revised pressure safety program to personnel that design/fabricate/test/inspect/maintain/repair and operate pressure systems (completed February 27, 2008); and 4) Perform an independent assessment of the Jefferson Lab pressure safety program (completed September 2, 2008). All corrective actions have been confirmed and closed in the DOE NTS system, with the last action completion date being September 2, 2008.

Measure 5.2.4 Requirement: Number of work observations on average per week and observations conducted are documented.

For the purposes of this measure, observations are performed by supervisors and managers or their designee.

TARGET: Conduct three work observations on average per week during the scheduled accelerator down (SAD) and at least one work observation per week on average for each major division (Accelerator, FEL, Physics, and Facilities. Document that these observations were conducted in docushare or equivalent.

*These observations can be performed by supervisor or designee.

JSA Performance:

The table below shows the actual number of work observations conducted by Division in FY08:

Major Division	Average Goal* (1 Per Week for Each Major Division and 3 Per Week During SAD)	Actual Work Observations Conducted
Accelerator	101	131
FEL	101	66
Physics	101	383
Facilities Management	101	312
Engineering		209
All Other		135
TOTAL Work Observations Conducted in FY08		1,236

* Average Goal = 25 Weeks of SAD X 3 Observations/Week + 26 Weeks Running X 1 Observation/Week = 101 Work Observations

FEL directed their 2nd quarter resources to preparation and follow-up to a late February 2008 Lab-sponsored ISM review. This review was conducted by ANL, BNL, and Calibre staff in preparation for the May-June 2008 DOE led ISM review. In addition, because it was recognized that FEL activities are not related to Accelerator SAD periods, FEL's goal for work observations was reduced in the FY09 PEMP accordingly.

Throughout FY08, JSA performed over three times the required number of work observations. Data collected from this system was used to identify and confirm site-wide trends, such as configuration control deficiencies and recurring slip, trip and fall opportunities that require proactive correction. We believe that the data collected by the entire organization demonstrates a functional, valuable system and supports the proposed grade of A-.

Opportunities for Improvement:

- As noted in FY07 DOE Evaluation Report → *The Department concedes that the 4th Quarter participation in recording workplace observations improved for select groups, and the overall performance met the criteria of the measure. Upon reviewing some of the work observation entries, there are still opportunities to improve the amount of detail being entered into the system, and improve the extent of line supervision participation in conducting the work activity observations. To ensure the transparency aspect of this measure is satisfied in the future, the Department must be allowed access to the detailed entries in the Contractor's Safety Observation system.*

Status: As requested, TJSO staff has been given access to the Work Observation Application program.

- TJJO 1st Quarter Feedback → *Based upon a review of some of the observation entries, it appears that individuals jointly conducting walkthroughs are separately entering the same observation and data; please clarify with those conducting walkthroughs that an observation is to be entered only once, not by each observer. To do otherwise results in multiple entries of the same observation and creates factually incorrect data/statistics. For the purpose of tracking PEMP performance, three people jointly observing the same activity would constitute one observation, not three.*

Status: Two procedures have been developed: Work Observation Procedure and Work Observation Application Instructions. These procedures are in draft and have been posted on the Work Observation Application web page. The procedures are designed to eliminate confusion about the conduct of work observations and provide instructions on how to enter data in the Work Observation Application. These procedures will be finalized before the end of the third quarter FY08. In addition, the algorithm for the Work Observation Application is being revised to ensure

that each individual receives proper credit for a work observation without multiple counting at the organizational level. The algorithm will be tested and validated before the end of the third quarter FY08.

- TJSO Mid-Year Feedback → *The information and detail of Safety Observation entries made by Facilities Management is commendable, and is encouraged to be used as a model for the other Divisions to follow. While the FEL has entered some quality observation information into the system, they have not met the terms of the measure for the number of work activities reviewed (Oct =9, Nov = 2, Dec =5, Jan =1, Feb = 0, Mar = 0, Apr =3, May = 4, June = 7). For the most part, the FEL has been in a SAD state for the majority of the FY. Efforts should be made to improve the distribution of staff participating in the Observation process and using this system (i.e., Physics), and reduce the duplicate entries that are evident (i.e., Physics, Accelerator).*

Status: FEL observations increased significantly in the 3rd and 4th quarters with a total of 35 and 18 observations being conducted respectively. Duplicate entries have been fixed as well. The improvement in distribution of staff participating in the Observation process and usage of the system is notable. In addition, JSA and TJSO agreed to change FELs target, due to its smaller size, to an average of at least one observation per week, as noted in final FY09 PEMP. FEL conducted a total of 68 work observations in FY08.

Objective 5.3 Provide Efficient and Effective Waste Management, Minimization, and Pollution Prevention

Measure 5.3.1: EMS scorecard self-evaluation is Grade C or better in majority of categories (D is best grade).

TARGET: Six of eight responses of grade C or better and no responses of “A”.

JSA Performance:

The 2007 Facility EMS Annual Report was submitted on December 3, 2007.

EMS Scorecard results for this performance period include 3 “C”s and 4 “D”s (D is the best grade), with no responses of “A”, exceeding the Measure target.

During FY08, JSA received a Hampton Roads Sanitation District “Gold” Pretreatment Excellence Award for its CY07 performance. As of September 30, 2008, JSA remains on track for another Gold award in CY08.

EMS SCORECARD METRICS	FY2008 RESULTS
Environmental Aspects	D
Goals, Objectives and Targets	C
Operational Controls	C
Environmental Training	C
Contracts	D
EMS Audit/Evaluation Procedures	D
Management Review	D
Last EMS Audit/Evaluation Date	9/30/2008

Table 18. Goal 5.0 Performance Rating Development

ELEMENT	Letter Grade	Numerical Score	Objective Weight	Total Points	Total Points
5.0 Sustain Excellence and Enhance Effectiveness of Integrated Safety, Health, and Environmental Protection					
5.1 Provide a Work Environment that Protects Workers and the Environment	A	3.8	30%	1.14	
5.2 Provide Efficient and Effective Implementation of Integrated Safety, Health and Environment Management	A-	3.5	60%	2.10	
5.3 Provide Efficient and Effective Waste Management, Minimization, and Pollution Prevention	A	4.0	10%	0.40	
Performance Goal 5.0 Total					3.64

Table 19. Goal 5.0 Final Letter Grade

Total Score	4.3-4.1	4.0-3.8	3.7-3.5	3.4-3.1	3.0-2.8	2.7-2.5	2.4-2.1	2.0-1.8	1.7-1.1	1.0-0.8	0.7-0
Final Grade	A+	A	A-	B+	B	B-	C+	C	C-	D	F

Goal 6.0 Deliver Efficient, Effective, and Responsive Business Systems and Resources that Enable the Successful Achievement of the Laboratory Mission(s)

Goal Requirement:

The Contractor sustains and enhances core business systems that provide efficient and effective support to Laboratory programs and its mission(s).

Objective 6.1 Provide an Efficient, Effective, and Responsive Financial Management System(s)

Measure 6.1.1 Requirement: Effectively track costs against budgets to ensure cost performance.

TARGET: Perform monthly variance analysis at WBS level 3 and report on JLab Insight. Develop monthly Estimates at Completion (EACs). Costs and commitments do not exceed available funding in the contract at the cost level of the Program Parent/Control Point in the financial plan at any point during the fiscal year. Monitor JSA Overhead spending and provide information as may be requested to facilitate DOE's lab-wide study of Overhead spending. Routine accounting and budget reports are accurate, timely and complete in accordance with requirements for key activities/deliverables. Budget formulation actions are completed in accordance with guidance and schedules provided.

JSA Performance:

JLab has implemented strict financial management processes and tools through its WBS and AWP to effectively manage the Lab's resources and still meet the goals and objectives outlined for FY08. Daily variance analysis was performed to control cost and commitment overruns during an extended Continuing Resolution. The CFO, the Budget Office, and the Lab's Level 2 Project Managers closely monitored spending against budget to ensure WBS and B&R activities were managed within established targets.

Support was provided during this period to develop responses to the ORO FY2010 Budget Call, the ORO FY2010 Security Management data call and the IT Management Budget Call. Support was also provided for the DNP FY 2010 Budget Call and the February 2008 meeting with Dr. Simon-Gillo, her staff, and the TJSO Site Manager. The Lab Director commented that the meeting was successful with follow-ups provided subsequent to the meeting to fill in details as requested.

In March the FY08 Annual Work Plan was finalized after conducting an exercise to update the AWP to reflect the Appropriation Budget, which was \$9M less than President's Request. The AWP facilitated the timely identification of budget impacts on workscope and deliverables and allowed for prioritization to ensure critical work was budgeted under the new funding constraints. Much of this data was utilized in the annual budget presentation to the Office of Science in February. The finalized AWP was loaded into the Lab's financial reports and several additional enhancements were started to utilize the new data set provided by the WBS and AWP. Many financial reporting enhancements can already be seen on JLab Insight today including the development of a new "Financial" tab. In addition, a Baseline Change Control process and system tool was built in order for the Lab's Project Managers to keep the AWP current and up to date and to provide a strong plan for work execution.

The Lab continues to make efforts to keep indirect costs low and as a result has the lowest rate in the SC complex. The overhead rate for FY08 was 35.5% which was lower than the baseline target of 38%. This was mostly accomplished by the Lab's proactive efforts to bring in more Work for Others and to allocate the indirect costs across a larger base. It was also made possible by finding efficiencies in the indirect areas and by carefully managing costs in a tight budget year with hiring and procurement restrictions. Further, monitoring and reviews of Overhead revealed the need to move costs associated with patents and licenses and electronic media from direct to overhead and an accounting change was requested in August 2008 to appropriately move these costs from a direct charge to Nuclear Physics to the Indirect Pool. Examples of specific efficiencies in the indirects can be found in the "Jefferson Lab Strategy to Balance Resources and Achieve More Science" which was developed and submitted to DOE in October 2008. This white paper documents the Lab's strategy to balance the Lab's resources and achieve more science. It is oriented around multiple initiatives being championed by the DOE Office of Science COO including the Cost of Doing Business and Increasing Infrastructure Investments.

Measure 6.1.2 Requirement: Demonstrate an effective financial management system through accurate, timely and complete financial reports to DOE, external reviews, internal and external audits, and self-assessments.

TARGET: Accurate, timely and complete financial reports are provided to DOE in accordance with Departmental requirements for key activities/deliverables including accelerated financial statement reporting and other financial data calls. No material/major findings as defined in DOE Order 413.1A Attachment 2 or findings from internal/external audit reviews. There are no repeat audit findings identified in any external reviews where contractor had received notification of the finding and had reasonable opportunity to implement corrective actions. Explore improvements to financial system through self-assessment process which takes into account recommendations from internal and external reviews as well as self-identified improvements. Analyze potential

financial system improvements. Recommend and submit cost effective improvements to management for consideration.

JSA Performance:

JSA submitted its 1st quarter OMB A-123 reports, which included the Summary of Progress Quarterly report, the Lab's DOE A-123 Assessment and Reporting Tool (AART) Suite, and the revised updated Site Implementation Plan on January 18, 2008. Please note, that the Site Implementation Plan was originally submitted on December 12, 2007, meeting the scheduled due date of December 14, 2007.

The Lab's CFO and Business Operations Manager participated in A-123 FY2008 Kick Off Conference Calls and DOE's A-123 FY2008 All Hands Training held at Oak Ridge November 6, 2007. It was also reported that the A-123 Tool Suite was successfully upgraded to AART 5.1.

The Corporate Management Assessment Areas and possible risks provided by the Oak Ridge Office Financial Evaluation and Accountability Division on November 8, 2007 were reviewed in order to factor them into the FY2008 Annual Risk-Based Assessment (ARCA). It was determined that these areas are applicable to processes at the Lab and will be further reviewed to determine timing and the extent of testing required and as deemed necessary per management's discretion to determine the extent to which testing will be performed.

The 2nd quarter OMB report was provided on April 18, 2008 as scheduled. JSA reported that valuation of the Corporate Management Assessment Areas and CAPs from FY07 were reviewed and implemented into the AART for the Q2 Report Submission. The AART was updated to include Corporate Management Assessment Areas in PCS Assess tab PCS Test and ARCA PCS tabs were populated at ARCA Update via Macro execution.

AART Control Sets and Internal test plans were developed and are consistent with A-123 Quick Start Testing Plan Guidelines to avoid any past test plan documentation issues.

The 3rd quarter OMB A-123 deliverables were submitted as scheduled and included the 3rd Quarter Report, Preliminary Assurance Letter, and the Updated AART.

On July 18, 2008 JSA submitted to the Site Office its OMB Circular A-123, Appendix A, Internal Control Evaluation – Assurance Statement to the Site Office. Based on the results of the evaluation, JSA provided reasonable assurance that internal controls over financial reporting as of June 30, 2008 were working effectively and no material weaknesses were identified in the design or operation of the specific controls over financial reporting evaluated.

Third and fourth quarter submittals were on or ahead of schedule. The Assurance Statement was submitted on schedule on August 1, 2008.

Process improvements for the period include:

- Finance implemented a process for Accounts Payable invoice approval through the use of the e-mail system to secure electronic approvals and to improve the timeliness of the approvals. Travel Service trained Travel Coordinators and travelers on the electronic travel reservation system. This contributed to decreased agency fees of \$11 per domestic airline transaction.
- Travel Services also trained travel coordinators in the use of the DOE Foreign Travel Management System to mitigate double efforts in getting foreign travel requested entered in the system thereby creating opportunities to be more efficient in processing.
- Travel Services has developed an electronic expense report form for visitors. They also developed a Foreign Travel/Conference Management request through trip completion status database.

Replies to planned and Ad-Hoc inquiries from TJSO and others on cost reports, WFOs, core and pre-INP funds, JTO 07 funding status, monthly FEL Navy Funding Report charts, and the Annual WFO Report for the Office of Science Laboratories were provided on a timely and accurate basis.

Several financial reviews were also completed during the year:

- An ORO review of related party transactions were completed with no material findings.
- An ORO review for full cost recovery for user facilities was conducted, where it was determined that DOE O 522.1 Pricing of Departmental Materials and Services, requiring Federal Administrative Charge (FAC) to be charged as a part of full cost recovery.
- Financial Management System Baseline Review conducted by ORO focused on funds control this fiscal year. No findings or recommendations were noted.
- An OIG and follow-up ORO review of Conference Management Costs was conducted where recommendations were made for Use of Registration Fees for Unallowable Costs, Control of Conference Management Accounting and Banking, and Conference Revenue Benefiting Outside Professional Organizations on which actions were taken to resolve / implement revisions. Corrective actions were outlined in a plan which was approved by TJSO.

The 2008 Management Representation letter was submitted on schedule on 09/25/08.

Opportunities for Improvement:

- TJSO Mid-Year Feedback → *the Lab's write-up focused solely on A-123 activity. Performance in other areas should also be addressed, such as responses to financial audits/reviews, self assessment activities, process improvements, etc.*

Status: See process improvements, financial audits, and reviews above.

Measure 6.1.3 Requirement: Financial attestations accurately reflect the status of internal controls and are provided in a timely manner.

TARGET: Financial attestations accurately reflect the status of internal controls and are provided in a timely manner. In addition, there are no reportable financial management internal control weaknesses identified in the annual financial statement audit.

JSA Performance:

The Financial Attestation letter accurately reflecting the status of the Lab's internal controls was submitted June 2, 2008 and there were no financial management internal control weaknesses identified in the annual financial statement audit. Further, the 2008 Management Representation letter was submitted on schedule on September 25, 2008, which provided affirmative representation from JSA in support of DOE's audit of the department's September 30, 2008 consolidated financial statements and its September 30, 2007 consolidated financial statements.

Objective 6.2 Provide an Efficient, Effective, and Responsive Acquisition and Property Management System(s)

Measure 6.2.1 Requirement: Demonstrate efficacy of the acquisition system through outstanding results on annual performance measures (Procurement Balanced Scorecard) that cover critical aspects of the procurement process.

Additional credit for exceptional performance in areas outside the balanced scorecard purview may be given (i.e., system enhancements, improvements in procedures and practices, implementation of new programs, etc.)

TARGET: Achieve Procurement Balanced Scorecard Total Score > 89 (“Excellent”)

JSA Performance:

The FY07 Procurement Balanced Scorecard report was submitted November 15, 2007 reflecting the Lab’s procurement activity, accomplishments, and proposed corrective actions. JLab received an “Outstanding” rating with a score of 94 out of a possible 100 points - evidence that the procurement function continues to provide outstanding and effective support to its customers and stakeholders under the DOE contract.

The FY08 Balanced Scorecard was developed and submitted October 24, 2007. The Lab has achieved another “Outstanding” rating of 93.5%.

Summary of FY 2008 Planned BSC Objectives and Measures		
OBJECTIVES	PTS	JSA PERFORMANCE
CP-1 Customer Satisfaction	25.0	25.0
IP-1 Effective Internal Controls	18.0	13.0
IP-2 Effective Supplier Management	3.0	3.0
IP-3 Effective Competition	2.5	2.5
IP-4 Effective Utilization of Alternate Procurement Approaches	7.5	7.0
IP-5 Timeliness of Acquisition Process	9.0	9.0
IP-6 Small Business	15.0	15.0
LG-1 Employee Satisfaction with Work Environment	5.0	5.0
LG-2 Employee Alignment with Mission & Lab Culture	10.0	10.0
FP-1 Optimum Cost Efficiency of Purchasing Operations	5.0	4.0
TOTAL	100.0	93.5

92 to 100 Points	Outstanding
82 to 91 Points	Excellent
72 to 81 Points	Good
62 to 71 Points	Fair
52 to 61 Points	Poor
<52 Points	Fail

The Procurement department implemented an on-line customer survey and tracking system that captures data related to subcontractor safety and performance. The system was deemed a “best practice” by DOE’s Procurement Executive Review Team (PERT) during a July review. The PERT also recognized the Department’s positive commitment to customer feedback and continuous improvement.

Procurement has completed 28 Advanced Procurement Plans (~\$70M) in support of FY09 and FY10 requirements for the 12 GeV Upgrade. Procurement activity is underway to meet targets.

The E-commerce Vendor Fair was held on September 25th with 19 vendors participating. Feedback from attendees indicates it was well received by both the vendors and JLab employees.

In the last two days of September the Procurement Office awarded over \$800,000 consisting of 117 procurement actions.

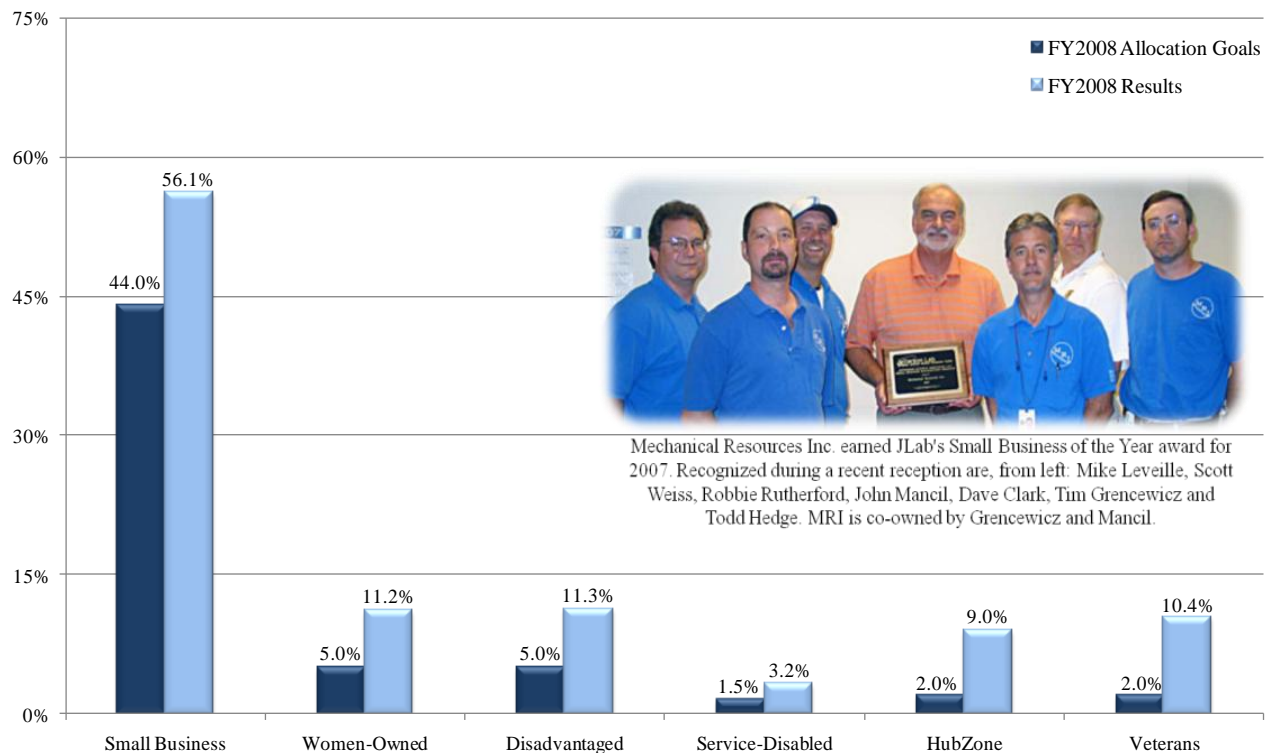
Measure 6.2.2 Requirement: Demonstrated efficacy of Small Business Program through goal achievement and effective outreach.

Additional credit for exceptional performance outside of small business goal achievement may be given (i.e., support to DOE's small business program, special outreach activities/support to disadvantaged, women-owned and service disabled small business firms, and/or advancement of awards to minority, women-owned and service disabled small business firms.

TARGET: Achieve All Small Business Goals Established in JLab's Annual Small Business Plan.

JSA Performance:

JLab exceeded all six Small Business Goals and submitted all DOE reports as scheduled during this performance reporting period. In addition, the Small Business Program Manager was recognized by the Office of Small & Disadvantaged Business Utilization (OSDBU) for participating in the "U.S. Women's Chamber of Commerce Spotlight on the U. S. Department of Energy." JLab was the only M&O invited to speak at this conference and had seven one-on-one sessions with specific businesses; the other speakers were from HQ DOE.



JLab's Small Business Manager continues to work with both Mentor-Protégé's (JLWS and TechnoGeneral) to advance their business acumen and growth. An award ceremony was held on April 25, 2008 for the Lab's "Outstanding Small Business Firm of the Year" for 2007. Mechanical Resources Inc. (MRI) was recognized for their performance and accomplishments in support of JLab. Since 1999 when

the Lab started recording subcontractor hours, MRI has recorded more than 135,114 work hours at the research facility, working late nights and holidays to complete its work.

As part of its Small Business Outreach Program, JLab sponsored a booth at the annual Virginia Minority Development Council Trade Fair held in May 2008 and they sponsored a booth at the Annual Department of Energy Conference/Trade Fair that was held June 2008 in San Antonio, TX.

Measure 6.2.3 Requirement: Demonstrate efficacy of the property management system through outstanding results on annual performance measures that cover critical aspects of JLab's personal property management.

Additional credit for exceptional performance in areas outside the balanced scorecard purview may be given (i.e., system enhancements, improvements in procedures and practices, implementation of new programs, etc.)

Overall evaluation of the measure may also consider any other relevant information directly or indirectly related to the property management system (property, material, and fleet) that provides evidence (either positive or negative) of the effectiveness/efficiency of the contractor in meeting the performance objective.

Other factors that may be considered in the evaluation of this objective include:

- Effectiveness of the property management system as validated by internal and external audits and reviews;
- Continual improvement of the property management system through the use of results of audits, reviews, and other information;
- The degree of knowledge and appropriate utilization of established system processes/procedures by Contractor management and staff; and
- Timely and responsive reporting for all areas of property management.

TARGET: Annual Property Balanced Composite Score is less than 96 points but greater than or equal to 93 points.

JSA Performance: FY08 Property Balanced Scorecard was submitted and approved by TJSO. JLab's Annual Property Balanced Composite Score is 98.59%.

JSA's Property Management System received formal approval February 25, 2007 for a period of three years based on DOE's oversight and operational awareness of the Lab's property management system. Approval criteria included the Lab's revision of the property management system, strengthening of internal controls and management oversight, professional qualifications of responsible individuals and evidence that property decisions are being made in the best interest of the Government. The property staff was commended for their continuing efforts to implement an efficient and effective property management system.

The FY08 Physical Inventory Report was submitted October 21, 2008, and the percent of inventory accounted for included → Equipment >\$50K = 100%; Equipment <\$50K = 100%; Sensitive = 99.55%; Stores Material = 100%; and High Risk = 100%. The annual property custodian validation process ran from March 1-15, 2008. During this period, each custodian validated all of the items on his or her inventory list and took the Property Custodian Refresher GEN 150 training.

Two GSA vehicle collision reports were submitted to the TJSO as soon as Facilities Management was apprised of the incidents and written reports for both were forwarded within the specified 5-day timeframe. Semi-Annual GSA Mileage reports and all FY08 Vehicle Replacement Receiving reports were also completed and submitted to the TJSO within the prescribed time period.

Excess property not picked up by DOE or other federal agencies is now being sold on Bid4assets.com. During FY08, JLab conducted 50 actions generating a total of \$42,092.

Unneeded Helios components (linear accelerator units, klystrons, and beam line components) were transferred to the Center for Advanced Microstructure Design and Devices at Louisiana State University. This transfer removed about two 40 foot trailer loads of excess equipment from the Lab. Lacking further interest by the U.S. physics research community, the main accelerator ring, spare dipole magnet and remaining ancillary equipment is in the process of being donated to Crockcroft Institute of Accelerator Science and Technology in Daresbury, UK.

During the year over \$320K of un-expensed “dead” stock were removed from the stockroom.

21,775 items were obtained through free stock with a value of \$37,537.

Excessed unneeded property and moved remaining contents from Blue Crab warehouse facility onsite resulting in an annual savings of \$54K.

Objective 6.3 Provide an Efficient, Effective & Responsive Human Resources Management System

Measure 6.3.1 Requirement: Balanced Score Card Results Based on the Following:

A. Measure 1- Diversity - Protected Class Representation: Representation of protected classes (PC) within each EEO-1 category at the end of the fiscal year compared to the beginning of the fiscal year (adjusted for voluntary separations).

Measurement:

PC Assessment Factor = $\frac{\% \text{ of PC to total workforce at the end of FY within each EEO-1 category}}{\% \text{ of PC to total workforce at the beginning of FY within each EEO-1 category}}$ where:
Meets Expectations = Achieve availability or increase representation in 85% or more of the EEO categories.

B. Measure 2 - Compensation - Alignment with the Market: Achieve compensation positions aligned with market practices to reflect the Laboratory’s mid-market compensation philosophy.

Measurement:

Compensation Factor = $\frac{\sum (\text{weighted average salary within each classification})}{\sum (\text{weighted salary range midpoint* within each classification})}$

*Assumes salary range midpoints reflect mid-market position

Meets Expectations = $\pm 3\%$.

C. Measure 3 – Learning and Growth – Supervisors will attend two management courses within the first year of assuming a supervisory level position.

Meets Expectations = 75% of supervisors complete two training courses.

D. Measure 4 - Learning and Growth – During the FY08 year, a targeted group of employees (25) will be identified for the Project Management (PM) Certification Program utilizing SkillPort. This goal is in support of larger DOE objectives with the Earned Value Management System (EVMS).

Meets Expectations = 90% of the identified employees will complete 2 out of 3 components required to obtain the PM Certification in FY08.

E. Measure 5 - Retention of Talent - Attrition rate of Top Performers.

Measurement: Percentage of top performers (employees who receive the top two performance ratings) who voluntarily separate from the Laboratory will be within 10 percent of the industry average based on recognized staff retention surveys.

Note: Excludes involuntary terminations due to funding issues, restructuring or contractor turnover. Excludes voluntary terminations due to retirement, or participation in a voluntary separation program or early retirement program.

Compared to industry average:
Meets Expectations = $\leq 10\%$ above industry average

F. Measure 6- Recruitment - Quality of Hire – Facilitate the new employee selection process to assure a continued world-class workforce.

Measurement: Combined average score of all Quality of Hire questionnaires completed by hiring managers within the first 6 months of employment.

Meets Expectations = 3.5 (on a scale of 1-5)

G. Measure 7 – Recruitment – Quality of Hires

Measurement: The first performance review for all new hires will receive a rating of 3 or above.

Meets Expectations = 75% of all new hires receive a score of 3 or above

H. Measure 8 – Attrition rate of new hires within the first year of employment.

Measurement: Attrition rate will be less than or equal to 10% annualized for new employees hired within FY08.

Meets Expectations = $\leq 10\%$

TARGET: 7 of 8 BSC Measures Meet Expectations and demonstrates improvement to human resources management through self-assessment process which takes into account recommendations from internal and external reviews as well as self-identified improvements.

Note: Jefferson Laboratory may be given additional credit for exceptional performance in areas outside the balanced scorecard purview (i.e., system enhancements, improvements in procedures practices, implementation of new programs).

JSA Performance:

Six of the eight BSC measures were met during this performance period:

Measure 1 - Diversity: Achieve Availability or Increase Representation in at least 85% of EEO Categories
Actual = 75%: JSA met 15 out of 20 EEO categories and continues to be underrepresented in four occupational categories (officials, scientists, computing and engineering). With the restriction on hiring due to a \$9M budget shortfall in FY08, it is challenging for the Lab to meet this goal as its ability to hire only mission critical positions influences the metric.

Measure 2 - Compensation: Alignment with Market Compensation Factor = +/- 3%
Actual = -1.1% (98.9%)

Measure 3 - Learning and Growth - New Supervisors Attend 2 Management Courses in First Year $\geq 75\%$
Actual = There were seven newly promoted supervisors on October 1, 2007 that would have been due to complete two courses during FY08 → six of the seven completed both courses in FY08 (86%). Also, three additional newly promoted supervisors that are due to complete their two courses at various times in FY09 completed them early during FY08. The remaining newly promoted supervisors during FY08 are projected to complete their two courses on time in FY09.

Measure 4 - Learning and Growth: At least 90% of 25 Identified Employees Earn Project Management Certification in Skillport
Actual = 20 out of 25 employees (80%) completed the agreed upon components of this measure during FY08. Item one was the introduction session and item two included nine on-line courses with each class taking approximately 3 hours to complete. Attributing factors that impacted the Lab's ability to meet this measure during this performance period were the site-wide HSS Inspection and staffing shortages across the Lab due to the budget shortfall. Some of the targeted individuals tasked with completing this training assumed multiple roles of responsibility to cover for labor shortages. Further, the 12 GeV CD-3 review occurred in July and several months of preparation were required to meet this aggressive timeline; again with some of the same individuals identified for this training. The Lab feels this measure is of importance and will continue to work towards full achievement in FY09.

Measure 5 - Retention of Talent: % of Top Performers Who Voluntarily Separate $\leq 10\%$ Above Industry Average
Actual = 5.3% (well below the industry average of 27%)

Measure 6 - Recruitment: Quality of Hire - Average Score of Questionnaires = 3.5 (on scale of 1-5)
Actual = 4.2 cumulative average questionnaire score

Measure 7 - Recruitment: Quality of Hires - 1st Performance Review for New Hires Receive Rating of ≥ 3 = 75% or Above
Actual = 98.6% (73 of 74 new hires had a performance rating ≥ 3)

Measure 8 - Attrition: Attrition Rate of Employees Hired in FY08 $\leq 10\%$
Actual = 6.9% (10 of 144 new hires left the lab during the year)

Additional HR activities include:

- The Benefits Valuation Study was submitted to TJSO on December 10, 2007.

- Recruiting Activity: During the first quarter, HR continued to support and partner with management to aggressively recruit and meet critical 12GeV hiring needs. With the continuing resolution and Appropriations Budget, hiring activity has significantly reduced. In December, the Lab implemented selective hiring of critical positions only. This action has resulted in lost opportunities with scheduled job fairs and other recruiting events that were planned during Q1 to continue building a pipeline of qualified talent.
- On-Boarding: Finalized New Employee Orientation (NEO) program and enhanced on-boarding process for foreign nationals: Although the new process was designed for groups of new hires, the hiring freeze has resulted in only small sections of the program being implemented. E-Recruiting - Virtual Job Fair: In evaluating new and innovative ways to appeal to college students and other qualified candidates across the country while minimizing cost, the HR team is in the exploratory stages of developing a web page that will serve as a virtual job fair when interested parties are directed to JLab to apply for positions on-line. This alternative way of recruiting will minimize travel cost to job fairs and allow broader exposure with real-time feedback to potential recruits. This project requires internal resources currently being utilized on other higher priority projects at the Lab and will be re-evaluated in FY09.
- Workforce Structuring: HR has partnered closely with management to ensure the budget restrictions do not result in a reduction in force. This situation is monitored continuously to ensure optimal use of the skills readily available to support the nuclear physics program and other mission critical projects.
- Key Position Search: A comprehensive job search for an ESH&Q AD began during Q2 and a strong qualified candidate was selected at the end of March. Mary Logue joined the Lab in June as the ESH&Q Associate Director.
- HR completed the first phase of the Job Task Analysis project in support of the HSS Review → identification of the EH&S requirements by job classification yielded Qualification Cards to supplement the ES&H training/tracking system making it easier to confirm an employee's basic knowledge and skills to perform safely in designated jobs and positions. These cards were well received by the HSS Team.
- During the 3rd quarter, the HR Department coordinated and hosted annual service award ceremonies, recognizing those employees with 5, 10, 15 and 20 years of service to the Lab. The ceremonies were a success as evidenced by the praise and feedback from the recipients.
- HR worked closely with Security and the IT Department to automate JList Registration for users and contractors that visit the Lab. This system upgrade will increase entry processing and decrease unnecessary training requirements. Training for hosting foreign nationals is under review and in the process of being updated to reflect DOE guidance.
- During the 4th Quarter the HR team partnered with management to revise the Job Classification Matrices for Computer Scientists, Nuclear Physics Scientists, Accelerator Scientists, Engineers, and Associate Coordinators. This was a highly interactive project with management and the result is a better tool to guide both employees and supervisors through the promotional consideration process as well as career development readiness for next levels.
- The Oakridge Bi-Annual Security Survey for Jefferson Lab occurred in August. HR areas reviewed included Training records and Visa/Immigration records. The HR categories received a satisfactory score, which is the highest achievable rating.
- The on-line performance appraisal system added enhanced features to compliment the matrixed staffing process as well as other items based upon employee and management feedback.
- A Co-Op proposal was submitted for review to enhance recruiting efforts with engineering and science students in undergraduate school and supplement critical hiring needs. Management is in support of this effort and the proposal was put forth for consideration to receive financial assistance through the Lab's Initiative Fund Program.

- In addition, during FY08 the Lab formed an Awards and Prizes Task Force to help facilitate the identification and nomination of JLab staff for awards and prizes in order to increase the number of nominations from JLab. The group is also working to develop an interactive system to make it easier for supervisors to find nominations in different industries and fields and to track nominations and awards.

Opportunities for Improvement:

- TJSO Mid-Year Feedback → *As discussed, for Measure 5, JLab should use the voluntary separation rate vice total separations rate identified in the BLS. Additionally JLab is aware of the requirement to submit their total compensation program self-assessment as required by contract clause Section H.18(b)(9)(iv).*

Status: HR modified the BLS rate for Measure 5 as discussed during the Mid-Year Review and this is reflected in the quarterly metrics for Q3 and Q4. The Lab's Compensation Self Assessment was submitted in Q3 to TJSO.

Objective 6.4 Provide Efficient, Effective, and Responsive Management Systems for Internal Audit and Oversight; Quality; Information Management; and Other Administrative Support Services as Appropriate

Measure 6.4.1 Requirement: Oversight Through Internal Audit - Internal audits completed in accordance with annual audit plan.

TARGET: Complete all audits in accordance with annual audit plan and provide at least one advisory service engagement. (Notes 1, 2, 3)

1 – Includes audit plan changes and/or substitutes.

2 – Due to the nature of internal audits completion dates may not coincide with the organization's fiscal year end. For Performance Level purposes, all current year audits (excluding Transaction Testing) are targeted for a report release date no later than 90 days after the close of the fiscal year, unless extenuating circumstances can be established. The Transaction Testing audit for Performance Level purposes is targeted for a report release date no later than 180 days after the close of the fiscal year, unless extenuating circumstances can be established.

3 – Percentage of completion will be utilized where practical including requests for other than annual reporting, e.g., mid-year.

JSA Performance:

Below are the scheduled and completed audits for FY08:

Audit Title	Scheduled Start	Scheduled Finish	Actual Start	Actual Finish	Notes
Property Management	10/07	12/07	06/08	08/08	Switched with Fraud Prevention and Awareness
Fraud Prevention and Awareness	01/08	03/08	10/07	12/07	Switched with Property Management
Contract Requirements Management	Postponed in FY08. Captured in FY09 schedule.				
Transaction Testing: FY08	07/08	09/08	09/08	TBD	Transaction Testing is scheduled to be completed as required by 12/08 to allow for testing of transactions processed through year-end.

Follow-Up Reviews: FY07 - EHS&Q Systems Integration - Performance Based Integrated Mgt System	07/08	09/08	08/08	09/08	
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As noted on the annual Audit Plan, actual start and completion dates are estimates and may vary as a function of audit priorities and management operations schedules. In that regard, to allow more efficient use of resources, the scheduled start and completion dates for the Property Management and Fraud Prevention and Awareness audits were switched. In addition, since Transaction Testing cannot be completed until all transactions have been processed through year-end, Transaction Testing will be finalized during the first quarter of the subsequent fiscal year, and the report issued shortly thereafter.

JSA sustained a vacancy in its Internal Audit office in FY08. During this performance period, JSA took the opportunity to consider various options in pursuing its internal audit processing, largely due to budget concerns, to include potentially independent audit sources all as a potential process improvement. The matter was discussed with the JSA Finance and Audit Committee Chairman for further consideration and support from its members, but in the end it was concluded that it would be best to maintain an internal audit capability. Upon this determination, JSA proceeded with posting and hiring an Internal Auditor to fill its vacancy. Gail Lucento, JSA's Internal Auditor, reported to JLab on August 16, 2008.

During this period, JSA was able to maintain Internal Audit Plan continuity and completed all audits as planned with the support of CSC and the JSA Board of Directors Audit and Finance Committee Chairman. A scheduled audit of JSA's Property Program was supported by Internal Auditors from CSC Applied Technology Division, out of Fort Worth, Texas. Two auditors were assigned to complete the Internal Audit planning, coordinate the in-briefings, conduct the audit, draft the report and render the draft report to the incoming Internal Auditor, who joined JSA concurrently to the beginning of the Property Program Audit. CSC's auditors and the JSA Internal Auditor coordinated with JSA Property and Management to complete this internal audit. The ability to rely on such Corporate reachback, at no additional cost to the contract, was assuring and ensured JSA's success in this area during the period.

Opportunities for Improvement:

- TJSO Mid-Year Feedback → *JLab continues to complete internal audits on schedule as identified in its self assessment. However, the property management audit scheduled for completion in December 2007 has not been issued. Additionally, the FY 2007 Transaction Testing review submitted was a part of the FY 2007 Audit Plan. There is some concern that JLab may be unable to complete the remaining audits on the schedule due to the Internal Audit Director position vacancy.*

Status: Property Management audit was completed in the 4th quarter by two visiting auditors from CSC Applied Technology Division at no cost to the Lab, and demonstrates the corporate reachback ability. In addition, property management and accountability enhancements were analyzed and implemented across the Lab. The FY07 Transaction Testing review, which was part of the FY07 Audit Plan, was completed and submitted on schedule. To capture all transactions processed through the end of the fiscal year, Transaction Testing is finalized in the first quarter of the subsequent fiscal year and the report issued soon thereafter. All planned audits, required to be completed this fiscal year, have been completed. One planned audit for Contract Requirements was deferred to FY09 to add value to the audit by allowing the implementation of revised directives, resulting from recent contract modifications, to fully mature. The Audit Plan was revised and approved by the TJSO.

Measure 6.4.3 Requirement: Monitor/Maintain a Quality Improvement Plan

TARGET: The following QA documents are to be signed by Lab management, distributed for immediate implementation, and posted on the Lab's QA group website by 9-30-08:

- QAP 1) Control of Measuring and Test Devices (Calibration)
- QAP 2) Control of Nonconforming Products
- QAP 3) Control of Suspect/Counterfeit Items
- QAP 4) Control of User Supplied Property
- QAP 5) Record Control Procedure
- QAP 6) Material Identification and Traceability Policy and Procedure(s)
- QAP 7) Receiving Inspection and Acceptance Testing Policy and Procedure
- QAP 8) Procurement Procedure
- QAP 9) Work Controls and Processes Procedure
- QAP 10) Equipment Design Procedure (phase II), (Conduct of Engineering Manual)
- QAP 11) Training and Qualification Procedure

- QIP 1) Incorporate Outputs from Contract Requirements Management and Analysis

JSA Performance:

The Quality Assurance and Continuous Improvement (QACI) department has obtained approval for ten of the eleven QAP procedures and the one QIP document and all have been posted on the QA group website. QAP 10 Equipment Design Procedure (phase II) was put on hold; however, 75% of the required documentation, including a draft procedure and a business process model has been completed. Plans to complete the remaining 25% of the project are scheduled for FY09. Summer accelerator operations and the 12 GeV specification and procurement priorities superseded resource priorities.

Several special projects were completed during this performance reporting period including Contract Requirements Implementation Plans and HSS ISM Assessment Prep (Documentation Team Workshop, Work Controls and Process Team Workshop), Incorporated Suspect/Counterfeit database with Lessons Learned database, Employee Job Task Analysis & Qual Cards, and the development and distribution of an annual CATS User survey. JLab also completed and obtained approval of the Graded Approach Procedure, which is a QAP Gap Procedure document that is not due until FY09. Early completion of this procedure was intended to replace or substitute the incomplete QAP 10 procedure. In addition, several supplemental QAP procedures and policies were produced and revised as site feedback indicated opportunities for improvement. These revisions include: Management of Contract Requirements; Operating Experience, Feedback, and Lessons Learned Program; Trend Analysis Procedure; Visual Examination (VT) Procedure for Examiners; Visual Examiners Quality Control Training and Certification Procedure for Weld, Braze, and Component Fit-Up Verification; and Event Trending Procedure.

In response to a request from the TJSO, JSA has implemented a new automated feature that provides notification when assessment corrective actions from TJSO assessments of JSA-JLab are complete. This mechanism indicates the Lab's continued efforts at improving the tracking and transparency of ongoing QA initiatives. The Corrective Action Performance Goal was exceeded during this performance period – another indication of the Lab's overall improvement since the start of the current contract. Overdue actions were closed or extended and new actions relating to the Requirements Implementation Plans were loaded into the system.

Although not a specific performance measure, JSA has committed resources to the review and revitalization of their Environmental, Safety, & Health (ES&H) Manual. This document contains many of the driving policies and procedures pertaining to ES&H and is directly related to the QA/CI program at

the Lab.

It is JSA's opinion that given the completion and implementation of 11 of the 12 targets, as well as the substitution of an FY09 item, the B+ performance measure for 6.4.3 has been exceeded and an A- should be awarded.

Opportunity for Improvement:

- FY07 DOE Evaluation Report → *The Contractor's energy and progress toward completing the QA commitments is acknowledged. Continued tracking and transparency of the QA improvement initiative is warranted. As expressed in the Departments April 2007 acceptance of the QA Plan, an update to this document is warranted to reflect the extensive changes made in supporting programs, and to highlight the elements that are still under development.*

Status: The QAP update was completed and submitted to TJSO on January 8, 2008. This measure was revised during the 2nd quarter to include specific QAP Gap procedures and one QIP action. Comments received from TJSO have been incorporated into the QAP and the revised document has been posted.

- TJSO Mid-Year Feedback → *Please continue to provide periodic status updates to the Site Office on the Quality Assurance Procedure that have been approved and issued to the staff for implementation.*

Status: The Quality Assurance and Continuous Improvement Manager has been conducting bi-weekly meetings with the TJSO counterpart in an effort to improve communications on key elements of the Quality program as well as specific status of the QAP.

Measure 6.4.4 Requirement: Deliver an integrated efficient and effective Information Technology Architecture that supports the mission of the Laboratory and benchmarks favorably with respect with other DOE laboratories, research universities and commercial industry best practices.

TARGET: The IT Steering Committee includes participation from key Laboratory stakeholders, users, outside experts from SURA universities and CSC, and TJSO. The Committee participates in the execution of IT Architecture vision and policy recommendations and considers Laboratory-wide IT performance, including prioritization of work, linkage to the Laboratory's mission, and progress on all IT related contract metrics. The IT Steering Committee works with programmatic division representatives to align the IT architecture and projects with Lab and divisional priorities as appropriate with budget levels.

JSA Performance:

The IT Steering Committee met regularly during FY08. In the first quarter they reviewed the goals and Annual Work Plans (AWPs) of the five major IT architecture areas. When the FY08 was finally passed, the budget was significantly less than the President's budget and required a prioritization and redoing of the goals.

During the second quarter the committee reviewed the AWP budget impacts and the new prioritization of IT goals. Additionally, due to the appropriation budget, the committee recommended the groups defer any integration of the FY07 IT External Review recommendations until FY09. During this same period JLab participated in the DOE ASCR Review of Nuclear Physics Networking, completed FY10 OMB 53's, and made changes in core IT operations to both improve the architecture and function within the budget.

The third quarter meeting was held on July 1st because of scheduling conflicts associated with the HSS review. The committee reviewed IT accomplishments and the budget impacts on the remaining IT goals, including the plans for Scientific Computing to upgrade the tape library for Physics data storage in FY08 instead of FY09. They also discussed FY09 budget planning. Task forces were created to further review desktop/sear management, cell phone and cable modem policies, and Physics data archiving.

During the forth quarter the committee was informed of the successful commissioning of the new tape library for Physics data storage. They reviewed FY09 IT plans and expected budgets. They were also briefed on JLab's implementation of the management of DOE OUO information, progress and rollout plans for seat management, and planned activities in the Office of Science Lab's response to recent Red Team cyber security activities.

Measure 6.4.6 Requirement: The Laboratory's Information Technology favorably benchmarks with other DOE laboratories, research universities and commercial industry best practices.

TARGET: The Lab will implement those recommendations from the FY2007 IT External Review Committee (including more formal project analysis and tracking) that the IT Steering Committee identifies for FY08 implementation commensurate with the Appropriation Budget.

JSA Performance:

The IT Independent External Review was conducted September 18 – 19, 2008. It included participation from CSC (Roy Hinrichs, Senior Director, Applied Technologies Division); DOE Laboratory (J. Pace VanDevender, Emeritus CIO, CTO and VP of Science, Technology and Partnerships, Sandia National Laboratories); and SURA (David Lambert, Vice President for Information Services and Chief Information). There were no major findings and the team made a number of positive comments. Due to the appropriation budget, implementation of the recommendations was deferred to FY09. Two of the recommendations were partially implemented in FY08 → the IT Division expanded the Helpdesk for the summer months as supported by the budget and technical certifications were obtained for several IT staff to formally demonstrate their credentials.

Objective 6.5 Demonstrate Effective Transfer of Technology and Commercialization of Intellectual Assets

Objective Requirement: The effectiveness of Technology Transfer activities at Jefferson Lab can be measured by three specific measures listed below. Note: Jefferson Lab may be given additional credit (points) for exceptional performance in areas outside the performance measures (i.e., system enhancements, improvements in procedures practices, implementation of new program, etc.).

Measure 6.5.1 Requirement: The proper stewardship of intellectual assets and Laboratory owned or originated technology as measured by Invention Disclosures and Patent Applications. Intellectual Property Stewardship as indicated by the annual number of Invention Disclosures and/or Patents awarded.

TARGET: Number of Invention Disclosures Greater than or Equal to 7 and Number of Patents Awarded Greater than or Equal to 3

JSA Performance:

There were 21 Invention Disclosures and nine Patents awarded during this performance period, well surpassing the annual target goals of seven and three respectively. Following is a list of the Invention Disclosures and Patents.

INVENTION DISCLOSURES (21):

ID No. 1229: *Small Portable/Mobile PET Imager for Intensive Care Unit and Other Bed-side Clinical Applications* invented by Stanislaw Majewski – disclosed 11/02/2007.

ID No. 1230: *Method and In-Situ Apparatus to Dynamically Image Radiotherapy Beams* invented by Stanislaw Majewski, James Proffitt, Daniel J. Macey, Andrew Weisenberger – disclosed 11/03/2007.

ID No. 1231: *Positron Emission Tomography (PET) and Optical Tissue Sample Imager* invented by Steven Falen, Richard Hoefer, Stan Majewski, John McKisson, Brian Kross, James Proffitt, Alexander Stolin, Andrew Weisenberger.

ID No. 1232: *Concept for Gamma Imaging Modules for SPECT and PET using Silicon Photomultipliers* invented by Stan Majewski and James Proffitt.

ID No. 1233: *A Method of Management of Coherent-Synchrotron-Radiation-Driven Degradation of Beam Quality During Bunch Length Compression* invented by David Ross Douglas and Christopher Daniel Tennant – disclosed 01/08/2008.

ID No. 1234: *Beam Energy Absorber, Converter and Heat Exchanger with Moving Core: Method and Apparatus* invented by Pavel Degtiarenko – disclosed 02/20/2008.

ID No. 1235: *Concept of a Compact Mobile Dedicated High Resolution PET Brain Imager* invented by Stanislaw Majewski and James Proffitt – disclosed 02/28/2008.

ID No. 1236: *High-Resolution Single Photon Planar and SPECT Imaging of Brain and Next Employing Two Co-registered Opposed Gamma Imaging Heads* invented by Stanislaw Majewski and James Proffitt – disclosed 03/05/2008.

ID No. 1237: *Remote Vacuum/Pressure Sealing Method/Mechanism for Critical Isolated Systems* invented by James D. Brock, Christopher Keith; **ID No. 1238:** *Dedicated Mobile High Resolution Prostate PET Imager with An Insertable Transrectal Probe* invented by Stanislaw Majewski and James Proffitt – disclosed 04/04/2008.

ID No. 1238: *Dedicated Mobile High Resolution Prostate PET Imager with an Insertable Transrectal Probe* invented by Stanislaw Majewski and James Proffitt – disclosed 04/04/2008.

ID No. 1239: *High Resolution PET Breast Imager with Improved Detection Efficiency for Lesions Placed Close to the Chest-Wall* invented by Stanislaw Majewski – disclosed 08/15/2008.

ID No. 1240: *Mobile/Portable Cardiac PET* invented by Stanislaw Majewski and James Proffitt – disclosed 04/16/2008.

ID No. 1241: *A Superconducting Connection between Adjacent Superconducting RF Cavities and Auxiliary Cavity Components* invented by Peter Kneisel, Jacek Sekutowicz, Gianluigi Ciovati – disclosed 05/08/2008.

ID No. 1242: *Coaxial Coupling Scheme for Fundamental and Higher Order Modes in Superconducting Cavities* invented by Jacek Sekutowicz, Peter Kneisel– disclosed 05/08/2008.

ID No. 1243: *Low Leakage Charge Integrating Amplifier for Precision Low Current Monitoring* invented by Vladimir Popov, Pavel Detiarenko disclosed 05/08/2008.

ID No. 1244: *Compact, safe and MRI-compatible hand-held non-imaging and imaging intraoperative beta and/or gamma probes based on Silicon Photomultipliers* invented by Stanislaw Majewski, James Proffitt – disclosed 06/11/2008.

ID No. 1245: *Deflecting/Crabbing Electromagnetic Structure for Particle Beam* invented by Jean Delayen – disclosed 6/13/2008.

ID No. 1246: *A Single Lens Laser Beam Shaper Converting Gaussian Beam to Super-Gaussian Beam for Suppression of Uniformity Destruction Induced by Diffraction Effect*, disclosed 07/08/2008.

ID No. 1247: *Device and Method for Environmental Radiation Monitoring with Self-compensation of Natural Background Variations*, disclosed 07/08/2008.

ID No. 1248: *Device for the Large-scale Synthesis of High-quality Boron Nitride Nanotubes*, disclosed to JSA/JLab 09/08/2008 for records (previously disclosed to NASA 05/06/08).

ID No. 1249: *Method for Image Reconstruction of Moving Radionuclide Source Distributions*,

disclosed 09/22/2008.

PATENTS AWARDED (9):

U.S. Patent No. 7,278,280 B1 issued October 9, 2007: *Helium Process Cycle* by Venkatarao Ganni.

U.S. Patent No. 7,279,882 B1 issued October 9, 2007: *Method and Apparatus for Measuring Properties of Particle Beams using Thermo-Resistive Material Properties* invented by Pavel V. Degtiarenko and Danny Wayne Dotson.

US Patent No. 7,315,141 B1 issued January 1, 2008: *Method for the Production of Wideband THz Radiation*.

US Patent No. 7,319,315 B2 issued January 15, 2008: *Voltage Verification Unit* invented by Edward J. Martin.

US Patent No. 7,332,722 B1 issued February 19, 2008: *Simultaneous Multi-headed Imager Geometry Calibration Method* invented by Vi-Hoa Tran, Steven R. Meikle, and Mark F. Smith.

US Patent No. 7,340,937 B1 dated Mar. 11, 2008: *Method for determining Hydrogen Mobility as a Function of Temperature in Superconducting Niobium Cavities* invented by Robert May.

US Patent No. 7,345,435 B1 dated Mar. 18, 2008: *Superstructure for High Current Applications in Superconducting Linear Accelerators* invented by Jack Sekutowicz, Peter Kneisel.

US Patent No. 7,409,834 B1 dated Aug. 12, 2008: *Helium Process Cycle* invented by Venkatarao Ganni.

US Patent No. 7,412,407 B1 dated Aug. 12, 2008: *Method for Electronically Publishing a Single Organization's Requirements in an Electronic Publication* invented by Timothy Cannella, Zopalla Brown, Julie Leverenz, Teresa Danforth, Shannan Kyte.

Measure 6.5.2 Requirement: The market impacts created/generated as a result of technology transfer and deployment activities as measured by licenses and/or options agreements executed.

TARGET: 2 licenses awarded or 2 option agreements executed or any combination of license and option agreements executed equal to 2.

JSA Performance:

There was one License awarded during FY08. JSA executed a non-exclusive license with Omley Industries for rights to its RF Feedthrough Technology during the 2nd quarter and there are now two licenses of this technology; one is with ACCEL and one with Omley.

During this performance period, JLab made significant efforts to lay the ground work for two licenses that did not materialize in this timeframe. The first was regarding brain imaging technology for medical purposes. Six major companies were contacted and three expressed interest in pursuing licensing. One of the companies (Ash) has followed through with the procedure specified on our web site. Progress is being made on this license and the actual license placement will slip into the next evaluation period. The second license was regarding our radial flange technology. The interested company (Meyer) was planning to use this technology in its International Linear Collider (ILC) proposal. As we were negotiating the terms, events overtook the effort, as Congress withdrew funding for the ILC. The effort is now on hold while the company pursues other markets before deciding to pursue a license. Much of the required groundwork has been done and effort to complete this license may progress well when the company the interested company renews its effort to continue.

The Breast-Specific Gamma Imaging (BSGI) machine developed at JLab was recently used at a Portland, Oregon hospital to discover a slow-growing cancerous tumor that had gone undetected by mammograms. The BSGI machine was manufactured by Dilon Technologies who licensed its high-



resolution gamma imaging technology from JLab. The patented imaging technology was developed by the Lab's Radiation Detector and Medical Imaging Group.

JSA's Technology Transfer Representatives and FEL Staff members participated in an educational outreach effort with William & Mary's Business and Law School classes in April 2008. This effort began with a tour of the Lab, an informational session with the Technology Transfer staff and one-on-one interviews by students - all in an effort for the students to learn as much as they could about industry partnerships with National Labs, technology transfer mechanisms and federally funded research. The outreach project culminated with the students presenting their licensing and commercialization plans for JSA/JLab owned technology. JSA staff members judged the students final projects for academic credit and provided immediate feedback on their work. At the school's request, JSA has agreed to continue this outreach effort with W&M to further educate college level students about government contracting and technology transfer efforts of national laboratories.

Measure 6.5.3 Requirement: Contributions to the transfer of Laboratory originated knowledge and technology as measured by customer assessments.

Points will be awarded based on the customer's overall adjectival rating of the system.

TARGET: Annual Customer Rating = "Excellent"

JSA Performance:

JLab sent a survey questionnaire to 18 different organizations that had business interactions with the Laboratory during this period. Eight responses were received for a 44% response rate. The average score was 4.8 out of a possible 5.0 (or 96%), resulting in an Annual Customer Rating = "Excellent". Those customers responding also provided narrative comments which were very complimentary, some of which are quoted below:

"The JLab experience is an order of magnitude faster than we have had with Fermilab and LBNL, even with the delay for verifying the participation of a foreign national. Keep up the good work! And Thanks".

"The experience and expertise in cryogenics at JLab is as good as any in the world. Keep on doing what you are doing. It works."

"The resources and scientific expertise of the staff are outstanding".

JSA, on behalf of the Laboratory, executed 5 CRADAs and 9 Work for Others for a combined \$2.6M additional funds in to the Laboratory in efforts to transfer knowledge and technological innovations and foster productive relationships among Laboratory research programs, universities, and industry in order to promote national economic competitiveness per contract mission set forth at 3.2.1 of the contract. While performance in this regard is not captured in a measure or an expectation, it is offered as an accomplishment for consideration toward Measure 6.5.

Table 25. Goal 6.0 Performance Rating Development

ELEMENT	Letter Grade	Numerical Score	Objective Weight	Total Points	Total Points
6.0 Deliver Efficient, Effective, and Responsive Business Systems and Resources that Enable the Successful Achievement of the Laboratory Mission(s)					
6.1 Provide an Efficient, Effective, and Responsive Financial Management System(s)	A-	3.6	25%	0.90	
6.2 Provide an Efficient, Effective, and Responsive Acquisition and Property Management System(s)	A	3.8	25%	0.95	
6.3 Provide an Efficient, Effective, and Responsive Human Resources Management System	A-	3.5	20%	0.70	
6.4 Provide Efficient, Effective, and Responsive Management Systems for Internal Audit and Oversight; Quality; Information Management; and Other Administrative Support Services as Appropriate	A-	3.7	15%	0.56	
6.5 Demonstrate Effective Transfer of Technology and Commercialization of Intellectual Assets	A-	3.6	15%	0.54	
Performance Goal 6.0 Total					3.65

Table 26. Goal 6.0 Final Letter Grade

Total Score	4.3-4.1	4.0-3.8	3.7-3.5	3.4-3.1	3.0-2.8	2.7-2.5	2.4-2.1	2.0-1.8	1.7-1.1	1.0-0.8	0.7-0
Final Grade	A+	A	A-	B+	B	B-	C+	C	C-	D	F

Goal 7.0 Sustain Excellence in Operating, Maintaining, and Renewing the Facility and Infrastructure Portfolio to Meet Laboratory Needs

Goal Requirement:

The Contractor provides appropriate planning for, construction and management of Laboratory facilities and infrastructures required to efficiently and effectively carry out current and future S&T programs.

Objective 7.1 Manage Facilities and Infrastructure in an Efficient and Effective Manner that Optimizes Usage and Minimizes Life Cycle Costs

Measure 7.1.1 Requirement: Asset Condition Index (ACI):

ACI = 1 minus the Facility Condition Index (FCI). FCI is the ratio of Deferred Maintenance to Replacement Plant Value. The FCI is derived from data in FIMS.

TARGET: Greater or equal to 95%.

JSA Performance:

The 2008 Mission Critical ACI was submitted in JLab's 2008 Ten Year Site Plan and is measured for critical facilities only. The current index is 0.963 based on the following data:

	FY2008		
	RPV	Deferred Maintenance	ACI
Total	\$ 185,025,125	\$ 9,512,627	0.949
Mission Critical (subtotal)	\$ 170,458,454	\$ 6,363,527	0.963
Buildings & Trailers	\$ 142,603,898	\$ 4,077,820	0.971
OSF	\$ 15,174,272	\$ 2,209,835	0.854
OSF-3000 (Conventional)	\$ 12,680,284	\$ 75,872	0.994

A \$656,700 deferred maintenance reduction project was substantially completed that replaced the Test Lab switchgear which will offset a portion if not all of the expected deferred maintenance increase due to new items identified during the facility condition assessments and current budget levels.

TJSO Mid-Year Feedback → Facilities and Infrastructure are being managed effectively and efficiently as demonstrated by performance in relation to established goals and strategies employed such as the use of subcontracts for maintenance activities to obtain competitive pricing for those activities.

Opportunity for Improvement:

- TJSO 3rd Quarter Feedback → *Area requiring additional justification for full credit on this objective: Explanation why ACI is below the SC goals based on overall long term strategy for maintaining a sound infrastructure at the Lab*

Status: SC ACI goals for FY 2008 were 0.964 for mission critical and 0.948 for mission dependent. The JLab ACI numbers are below the SC goals primarily due to identified deferred maintenance in the Test Lab (XXX) and trailers beyond their useful life (xxx). The Technology and Engineering Development Infrastructure (TEDF) has been identified as a Science Lab Infrastructure (SLI) project to correct the deficiencies in the Test Lab and allow removal of the aging trailers. Based on current project funding profiles this project is scheduled for completion in FY 2014.

Measure 7.1.2 Requirement: Extent Contractor validates accuracy of data in the Facilities Information Management System (FIMS).

TARGET: The contractor has demonstrated validation of the accuracy of data in the FIMS data base with at least 90% statistical certainty that the data contains no more than a 10% error rate.

JSA Performance:

JLab's FY08 FIMS Validation was conducted on February 27 – 28, 2008. The results demonstrated that

the data contained a 0% error rate, which exceeded the target of less than a 10% error rate.

Measure 7.1.3 Requirement: The efficiency and effectiveness of contractor efforts for sustainment, recapitalization, and acquisition of required facilities and infrastructure to support laboratory programs through the performance of maintenance by achieving MII of at least 2%.

TARGET: MII = 2% and the contractor has demonstrated that maintenance activities, recapitalization and acquisition of facilities and infrastructure to support laboratory programs have been performed efficiently.

JSA Performance:

The required MII (facilities maintenance cost) for FY08 to meet the 2% goal is \$3,554,188. JLab's total maintenance cost in FY08 was \$3,768,753. This figure includes completion of a \$656,700 deferred maintenance reduction project that replaced the Test Lab switchgear.

Facilities Management continues to expand the use of the Maximo work control system. The addition of a work control position has improved data quality and reporting capability.

Opportunity for Improvement:

- TJSO 3rd Quarter Feedback → *Area requiring additional justification for full credit on this objective: Explanation why MII is below 2% and how this relates to the long term strategy*

Status: Total expenditure on facilities maintenance exceeded 2% of the RPV. The Lab has been carefully coordinating facilities maintenance with planned SLI and GPP project to make the most of limited dollars. Corrective maintenance in the Test Lab and for trailers is performed as appropriate taking into account the planned work identified in the upcoming SLI project. SC Labs are transitioning from a minimum expenditure to a mission readiness facilities management model. The Lab has been fully engaged in this effort with a representative participating in the development of the mission readiness model.

Measure 7.1.4 Requirement: An update to the Ten Year Site Plan is developed and approved by DOE that adequately addresses the site's contribution to meeting the Agency wide goals of the Secretarial Transformational Energy Action Management (TEAM) initiative and the goals set forth in Executive Order 13423.

TARGET: The plan is acceptable to DOE no later than September 30, 2008.

JSA Performance:

As required by Executive Order 13123, JLab submitted the FY07 Annual Energy Report on December 10, 2007. FY07 energy expenditure was 20.5% less than the 2003 energy baseline. (FY07 = 102,156 BTU/GSF; FY03 = 1289,457 BTU/GSF). The Lab's 2008 Annual Business Plan was submitted on May 30, 2008 that addressed Ten Year Site Plan and sustainability. The Lab submitted a draft Executable Plan on 29 September 2008 addressing the TEAM initiative and EO 13423.

The Lab signed an MOA with Hampton Roads Sanitation District to perform a feasibility study to use "Reuse Water" for cooling towers and landscape irrigation in lieu of potable water.

The Lab Vehicle Officer was notified by GSA in March that six of our 21 vehicle fleet would be replaced in April 2008 with E85 fuel vehicles. The Lab plan was to replace the remaining vehicles in 2009 and 2010 however this may be delayed beyond the 2010 goal due to GSA policy for replacement of vehicles.

The Lab has come to a conceptual agreement between GSA and NASA Langley for the Lab to refuel their E-85 vehicles at NASA Langley. Details of the agreement are being finalized.

Opportunity for Improvement:

- TJSO 3rd Quarter Feedback → *Area requiring additional justification for full credit on this objective: The element tied to the TYSP that needs to be coordinated with the Site Office prior to Sept 30 is the Executable Plan*

Status: The draft Executable Plan was coordinated with the TJSO and submitted on September 29, 2008.

Objective 7.2 Provide Planning for and Acquire the Facilities and Infrastructure Required to support Future Laboratory Programs

Measure 7.2.1 Requirement The Ten Year Site Plan (TYSP) is recognized by funding entities as providing a sound strategy for acquisition of required facilities and infrastructure to support future laboratory programs.

TARGET: The contractor assures that the TYSP is appropriately developed, reviewed, updated, in line with the Laboratory Business Plan, and utilized as a Laboratory management document.

JSA Performance:

JLab had a leading role in developing a new method for ensuring the mission readiness of Lab facilities and in the development of a new and improved 10 Year Site Plan that was recently submitted to the SC COO. Facilities Management played a key role in doing extensive research to develop the Mission Readiness Plan that was briefed and submitted to SC. The Mission Readiness proposal was well received and will be implemented complex wide for science labs in FY09.

Facilities Management in conjunction with Lab production and research elements had determined the north Test Lab addition will be modified to accommodate the HD-Ice lab facility requirements. The project will add about 1,000 SF to the Test Lab. Design is underway with construction planned for FY09 contingent on the final budget.

Measure 7.2.2 Requirement: Cost and schedule performance on all GPP projects and maintenance projects greater than or equal to \$100K (for construction phase of projects only).

Maintain level of construction control to limit change orders and cost overruns to only those which bring added value to the project or are appropriate to produce the desired end product. Performance level will be calculated by taking the contracted amounts compared to the final contract actual costs considering all applicable funding increases for all appropriate contracts. Increases considered not applicable are those whose root cause is:

- Post-design programmatic change by user (physical or schedule)
- New technology deemed a value-added inclusion (post-award)
- Value engineering proposals accepted (both additive and deductive)

Schedule performance will be based on average of the actual number of days to completion of identified projects (or designated milestones) to the number specified by the original contracts. This will be expressed as a coefficient of actual divided by contracted. Additional time attributed to the following categories will not be included for the purpose of this metric.

- Acts of God (as contractually accepted)
- Labor disputes/strikes

- Documented material unavailability (contractually accepted)
 - User desired post-award change orders for which additional time is appropriate
- For purposes of this report, “completion” shall be when the project is physically complete; turned over to user or beneficial occupancy taken

TARGET: Applicable changes and cost overruns are less or equal to 8% of the total awarded bid amount and average scheduled index actual number of days to project completion or beneficial occupancy to original contract duration in the awarded contract is > 1.0 to ≤ 1.1 .

JSA Performance:

Projects completed to date:

Project	Schedule Index	Cost Index
East Site Drainage Improvements	0.77	0.999
General Site office Trailers	0.74	0.792
Test Lab Lifts	1.0	0.990
Building Metering	1.0	0.783
General Purpose Building	0.84	0.969
DCC Interface Repair	0.92	0.694
ESR Transformer	1.03	0.971
Test Lab Switchgear Replacement	0.91	0.939

Projects in progress:

Fire Alarm Upgrade – Construction underway and is expected to be completed in October 2008.

Opportunity for Improvement:

- TJSO 3rd Quarter Feedback → *Area requiring additional justification for full credit on this objective: Data on GPP project cost and schedule performance*

Status: Project cost and schedule data posted as well as presented above.

Measure 7.2.3 Requirement: GPP planning and execution are well coordinated to ensure effective utilization of resources.

TARGET: The contractor coordinates project planning and provides information on project status in accordance with the TJSO expectations provided in the TJSO GPP Management Process.

JSA Performance:

JSA has made good progress on implementing and adhering to the GPP Management Process requirements as outlined in a letter from TJSO dated April 20, 2007. The following is a list of the requirements along with a status of each.

- Annual update to Ten Year Site Plan used to update/propose planned projects - including round table meeting with TJSO for review and prioritization of proposed projects.
Status: Discussed SLI and TYSP strategy with TJSO during preparation. Also discussed and provided IFI crosscut.
- Round table review is revisited at least semiannually or more often if major changes are being considered.
Status: Semiannual reviews completed with TJSO.

- JLab provides summary of GPP scope, schedule, and cost estimate prior to the start of new projects for approval.
Status: Provided GPP scopes to TJSO last Fall.
- JLab provides breakout of GPP funding allocation by year funding was appropriated, for all uncosted GPP funding, 30 days after TJSO approves the start of new GPPs.
Status: FY08 baseline was developed and agreed to with TJSO in October. It is currently posted on Insight.
- JLab reports on status (estimated % complete) and cost (actual to date and commitments) quarterly using Insight.
Status: Developed a monthly report that tracks against the baseline. Reports for October 2007 through September 2008 are all posted on Insight and the percentage of completion is listed on each report.
- JLab provides justification for changes to GPP scope, schedule, and/or cost estimate for TJSO review quarterly.
Status: JLab requested a baseline change meeting with TJSO for two projects: Building Metering and Test Lab Lifts. Baseline changes approved by TJSO.
- Performance measures for Cost and Schedule Performance on Projects > \$100K are included in the annual PEMP.
Status: This item was included in JLab's FY08 PEMP in Measure 7.2.2 "Cost and Schedule on Projects >\$100K". The Lab's performance in this measure is noted on the previous page under Measure 7.2.2, JSA Performance.

Opportunity for Improvement:

- TJSO 1st Quarter Feedback → *Jefferson Lab is encouraged to continue to provide status reports on General Plant Project cost and schedule performance and to maintain the baseline document in accordance with the Site Office guidance (issued 4/20/07).*

Status: GPP baseline was developed, approved by TJSO and posted on Insight. Monthly project cost and schedule report was developed to track against the baseline and was posted on Insight for each month in this period. Met with the Site Office in April to discuss baseline changes for meeting Project and Test Lab Lifts. Documentation was submitted. In addition, the percent complete for each project is on the report between schedule index and project budget.

- TJSO Mid-Year Feedback → *The Lab has improved the process for coordinating planning and execution of General Plan Projects with the Site Office. Commitment of \$2M/year to GPP is commendable for acquiring facilities and infrastructure necessary to support future laboratory programs. It will be necessary for the Lab to provide a reference for the strategy defined in measure 7.2.5 (increasing investment in infrastructure which minimizes the cost of doing business) to achieve full credit for this objective. Insight posting of GPP progress reports has been very beneficial.*

Status: Draft Infrastructure Investment strategy was submitted to TJSO in September for comment.

Measure 7.2.4 Requirement: Demonstrate effective project management and leadership for the Technology and Engineering Development Facility (TEDF) project.

TARGET: The contractor provides the necessary documentation to support critical decisions on schedule for the funding profile provided.

JSA Performance:

The Lab identified the required funding during a very tough budget year to support the acceleration of CD-1, which could serve to ensure funding for TEDF in FY09. The Conceptual Design Report and the Preliminary Project Execution Plan (PPEP) were completed June 20th, the Independent Design Review was conducted June 26th – 27th, and the architectural subcontract was awarded on September 11, 2008. The TEDF Independent Project Review for CD-1 was held August 13 – 14, 2008 and recommendations from this review were incorporated and submitted to the Energy Systems Acquisition Advisory Board Review held on September 23, 2008. CD-1 was approved on September 23, 2008.

An A-E contract for advanced conceptual design was awarded September 11, 2008. A kick-off meeting with the A-EE, Integrated Project Team, and the Tenant Committee was held at JLab on September 24, 2008. PED (design) funding has been requested for FY09.

Opportunity for Improvement:

- TJSO 3rd Quarter Feedback → *Area requiring additional justification for full credit on this objective: Satisfaction of program requirements for approval of CD-1 and strategy for demonstrating sound project management*

Status: CD-1 approved on September 23, 2008.

Measure 7.2.5 Requirement: Develop a strategy for increasing investment in infrastructure which minimizes increases to the cost of doing business.

TARGET: Develop strategy by September 30, 2008.

JSA Performance:

JLab submitted a draft infrastructure investment strategy to TJSO in September for review and comment. All comments received were incorporated and the draft was then expanded to include other related issues such as Cost of Doing Business, unfunded mandates, budget levels, etc. JLab took the initiative to develop this more comprehensive strategy in order to help respond to multiple initiatives being chaired by the SC COO.

In addition, JLab was proactive in preparing a new SLI request for SC that will address long standing utility issues at the Lab. The proposal was very well received by Mark Jones, John Yates and the SC COO and if approved, JLab will be able to reduce deferred maintenance and improve energy efficiency – two major factors that affect the cost of doing business.

Opportunity for Improvement:

- TJSO Mid-Year Feedback → It will be necessary for the Lab to provide a reference for the strategy (increasing investment in infrastructure which minimizes the cost of doing business) to achieve full credit for this objective.

Status: Strategy was developed and submitted ahead of schedule.

- TJSO 3rd Quarter Feedback → *Area requiring additional justification for full credit on this objective: Strategy for increased infrastructure investment as indicated at mid-year*

Status: Strategy was developed and submitted ahead of schedule.

Table 29. Goal 7.0 Performance Rating Development

ELEMENT	Letter Grade	Numerical Score	Objective Weight	Total Points	Total Points
7.0 Sustain Excellence in Operating, Maintaining, and Renewing the Facility and Infrastructure Portfolio to Meet Laboratory Needs					
7.1 Manage Facilities and Infrastructure in an Efficient and Effective Manner that Optimizes Usage and Minimizes Life Cycle Costs	A-	3.5	40%	1.40	
7.2 Provide Planning for and Acquire the Facilities and Infrastructure Required to support Future Laboratory Programs	A	3.9	60%	2.34	
Performance Goal 7.0 Total					3.74

Table 30. Goal 7.0 Final Letter Grade

Total Score	4.3-4.1	4.0-3.8	3.7-3.5	3.4-3.1	3.0-2.8	2.7-2.5	2.4-2.1	2.0-1.8	1.7-1.1	1.0-0.8	0.7-0
Final Grade	A+	A	A-	B+	B	B-	C+	C	C-	D	F

Goal 8 Sustain and Enhance the Effectiveness of Integrated Safeguards and Security Management (ISSM) and Emergency Management Systems

Goal Requirement:

The Contractor sustains and enhances the effectiveness of integrated safeguards and security and emergency management through a strong and well deployed system.

The Sustain and Enhance the Effectiveness of Integrated Safeguards and Security Management (ISSM) and Emergency Management Systems Goal shall measure the Contractor's overall success in safeguarding and securing Laboratory assets that supports the mission(s) of the Laboratory in an efficient and effective manner and provides an effective emergency management program.

Objective 8.1 Provide an Efficient and Effective Emergency Management System

Measure 8.1.1 Requirement: Conduct emergency management exercises* as identified in the ERAP for FY08. Response to an actual or simulated emergency event demonstrates an above average level of proficiency and opportunities for improvement are identified and acted upon. Participate in at least one local emergency preparedness exercise assisting a local entity in their preparedness.

* An actual emergency may be counted as an exercise in the quarter in which it occurs.

TARGET: Conduct one emergency management exercise*. The extent and level of implementation should be proportional to the nature and magnitude of threats to JLab and its interaction with off-site emergency responders. Response to an actual or simulated emergency event demonstrates an above average level of proficiency and opportunities for improvement are identified and acted upon. Participate in at least one local emergency preparedness exercise assisting a local entity in their preparedness. Results of internal and external reviews, surveys and inspections demonstrate that Emergency Management System is effective, and Emergency Management Program has no repetitive deficiencies (or) corrective actions are completed in accordance with approved corrective action plan.

JSA Performance:

Two actual events occurred in the 1st quarter that tested emergency procedures and capabilities → Production Chemistry Room acid splash – investigated with lessons-learned promulgated; and the project to replace Test Lab electrical switchgear over the holidays necessitated prolonged reliance on emergency generators for Test Lab and for Guard Station. Both ran reliably for the duration – a longer period than any JLab generator has been deployed heretofore.

JLab participated with schools and businesses across Virginia in the Tornado Preparedness Day event held on March 18, 2008. The Lab's site wide alert system was deployed to indicate the beginning and the end of the drill and through this system a message was delivered to all pagers, cell-phones, and email accounts. JLab staff served as observers during the drill and will provide a summary report of their findings to lab leadership.

A rescue exercise that was conducted on March 24, 2008 included participation from the Newport News Fire Department (Technical Rescue Team and Station 10 Ladder Unit), JLab Material Handling SMEs and designated observers. The exercise involved a fallen worker being suspended approximately 30 feet above the Test Lab floor by harness and lanyard.

A Site Wide Notification System exercise was conducted and included all JLab domain e-mail accounts and alpha-numeric pagers; there were no systematic problems encountered. CANS Door & Duress Alarm Verification and Testing of Remote Alarm (CANS) Feature on Eyewash & Safety Showers in HF Acid Area were both successfully completed during this period.

In the Mid-Year Feedback, TJSO identified a concern in the timely completion of after action reports. There was a severe weather tabletop exercise conducted on July 29, 2008. The report was quickly produced, and submitted to the Emergency Management Committee for review. After resolution of comments, the report was published and follow-up actions entered into CATS so that they may be tracked to completion. One lessons learned from this exercise was that early decisions to take action in the event of a hurricane reaching land in Hampton Roads was key to successful execution of all pre-planned actions. JLab took this lesson to heart when Tropical Storm Hanna presented a potential threat to the Lab as it approached the Mid-Atlantic region during the period of September 3 – 8, 2008. The Emergency Management Team (EMT) directed an increase in site preparedness to HPC-2 accordingly. This led to site-wide staff communications, group preparations in accordance with checklists, and reports on progress to division management. Within hours of the decision to move to HPC-2 (and in some cases beyond), it was implemented. A tour of the site the afternoon of September 5th (Tropical Storm Hanna was projected to affect the area that night and into the next day) confirmed that it was prepared for high winds and significant rain. A critique was conducted on September 24th and the report was published. Follow-up actions are in CATS to allow laboratory management to track actions to closure.

Mid-way through FY08, DOE Order 151.1C was placed into JSA's contract. This order requires the completion of a hazard survey to serve as the basis for determining the requirements of the JLab

emergency management program. The survey and subsequent program plan requires a level of discipline and rigor above what has been employed in the past. As evidenced by the preparations for Tropical Storm Hanna, JLab is able to manage emergencies. This effort will take the program from an expert-based program to one that is systematized and organized to assure a sustained preparedness level. These efforts will continue into FY09.

Opportunity for Improvement:

- TJSO Mid-Year Feedback → *Concerns exist in this area. Two emergency management exercises were conducted. No after action reports have been received. No corrective action plans have been submitted for issues identified by the site office during the exercises. The main purpose of exercises/drills is to extract valuable lessons learned. Without such, drills/exercises are of limited value. Issues noted in the FY07 Final PEMP are still valid.*

Status: The after action report on the rescue exercise has been completed and is posted on the web (http://www.jlab.org/intralab/emergency/exercise_reports/). The after action report for the sheltering drill is in progress. Observations provided by the Site Office are being dispositioned along with the numerable comments provided by the Laboratory population. This is being performed in accordance to the process described in ES&H Manual Chapter 3510-Technical Appendix T8, "Emergency Management Drills & Exercises".

- TJSO 3rd Quarter Feedback → *The draft action report for the sheltering drill conducted on March 18, 2008 was not distributed until August 8, 2008. Corrective actions are not distinguishable from areas of improvement in the draft (as required in the ES&H Manual Chapter 3510 – Technical Appendix T8, "Emergency Management Drills and Exercises" page 3 of 3). On a positive note, there will be opportunity for the input by the emergency management committee for review of this draft report.*

Status: See above discussion.

Objective 8.2 Provide an Efficient and Effective System for Cyber-Security

Objective Requirement:

Assure appropriate level of cyber security risk assessment and program planning and that Jefferson Lab computer systems are not compromised or used in attacks on other Internet locations.

TJSO 3rd Quarter Feedback → Concur on compromises, identification, and remediation.

Measure 8.2.1 Requirement: Number of times JLAB computer systems were compromised or were used to attack other systems and that any incidents were reported within the required timeframes. This is for system level (root) compromises or incidents where jlab.org nodes were used to carry out cyber attacks on other locations on the internet.

$$CSI = RC + 0.5(CA)$$

TARGET: CSI = 1; and favorable results on internal/external reviews, surveys and inspections that demonstrate the cyber security program is: effective, integrated into laboratory culture, and laboratory leadership's commitment to strong cyber security performance.

JSA Performance:

CSI = 0

There were no JLab computer system level (root) compromises and no incidents in which a jlab.org machine was used to attack other systems during this performance period.

Measure 8.2.2 Requirement: Ensure less than 5% of scanned machines are flagged by the SANS system as having a severe vulnerability.

TARGET: <5% of scanned machines identified as having a severe liability.

JSA Performance:

The average percentage of systems during FY08 with "critical" (SANS Top20) vulnerabilities identified by the vulnerability scanning program was 4.0%; however, the average percentage for the 4th quarter of FY08 was 0.1% which far exceeds the goal of < 5%. Two factors made possible the steady improvement in the measure throughout the year. The first was the use of a Helpdesk team member and a Cyber Security Analyst to address the identified vulnerabilities. The second was the 3rd quarter replacement of the commercial product used to manage the Lab's vulnerability scanning with a locally developed application that reports a more accurate measure. The new application reports true daily figures and has fewer false positives; the former application was reporting stale information from systems that were no longer on line. Additionally, as part of the remediation process, IT Division staff reconfigured stand-alone systems as centrally managed systems. This has allowed for faster deployment of security patches and better configuration management. These two activities result in a faster and more efficient response to new vulnerabilities.

Opportunity for Improvement:

- TJSO Mid-Year Feedback → *Trend analysis showed a slight concern with the pace of remediation for identified scanning vulnerabilities, but the Lab has recovered and improved with the reallocation of resources toward this metric. Agility will become a key aspect as the lean budget will require the ability to adjust quickly to emerging (and changing) OCIO guidance/requirements.*

Status: Performance against this measure improved significantly from 7.8% in the 2nd quarter to 0.1% at year-end, exceeding the goal of less than 5%.

Measure 8.2.3 Requirement: Average number of working days to remediate (reconfigure, repair, patch, mitigate, or classify as false positive) those systems identified by alarms from the automated system log filtering and notification process including the intrusion detection system.

TARGET: Remediate in five working days.

JSA Performance:

The average number of working days to remediate systems identified by alarms from automated system log filtering and notification process including the intrusion detection system has consistently decreased during this performance period from three days in the first quarter to 0.9 days at year end. As mentioned in the previous measure, this figure reflects the reallocation of Helpdesk and Cyber Security staff.

Vulnerability remediation and the reconfiguration of many stand-alone systems to centrally managed systems have helped reduce the number of alarms and contributed to the ability to address alarms faster and more efficiently.

Measure 8.2.4 Requirement: Effectively manage cyber security enhancement projects in the areas of authentication, encryption, network (audit, registration, dynamic configuration, VPN, etc.), and security training. In the first month of the fiscal year, and with quarterly updates, determine the new requirements scope and schedule in agreement with the Thomas Jefferson Site Office.

TARGET: Manage projects for cyber security enhancements on schedule, as applicable to JLab according to a revised Plans of Action & Milestones (POA&Ms) and project schedules matched to the appropriation budget

JSA Performance:

Cyber Security enhancements conducted during FY08 include: Enhanced Boundary Controls of the Scientific Computing Enclave completed November 15, 2007; FEL Sensitive Network Segmentation completed December 15, 2007; Physical Security Upgrades in Data Centers completed August 1, 2008; Review and Update PIAs completed May 1, 2008; Implement Position Categorization System completed August 1, 2008; and Enhance Boundary Controls of the Experimental Physics Enclave completed July 1, 2008.

The date for Physical Security Upgrades in Data Centers was originally scheduled for completion May 2008, but was extended to August 2008 due to resource limitations and was completed. Progress continued on Extended Internal Network Monitoring Capabilities Extended Deployment of 2-Factor Authentication to Selected Workstations, Off-Site Storage Needed for Critical Operational Data, Laptop Encryption System, and 2-Factor Authentication and Laptop Encryption for FEL Sensitive Machines as scheduled. As an example, a solution for Window laptop encryption was chosen and a limited deployment is expected during the 1st quarter of FY09 and internal network monitoring capabilities have been extended, just at a slower pace. Note these projects had previously been deferred to FY09 due to the Appropriation Budget. The IT Division has worked to minimize the impact of the current budget by distributing the impacts and keeping the users informed.

Objective 8.3 Provide an Efficient and Effective System for the Protection of Special Nuclear Materials, Classified Matter and Property

TJSO 3rd Quarter Feedback → *Full credit for this objective is contingent on results and response to the Security Survey.*

Measure 8.3.1 Requirement: Maintain an effective Security Program, demonstrated by:

- Ensuring non-U.S. citizens' from sensitive countries who have badged access to JLab facilities, or perform work on CRADAs or Work for Others are identified, and are entered into the Foreign Access Central Tracking System.
- Current timely and approved security-related Admin Policy and Security Plans.
- Reportable and accountable "Other Nuclear Materials" are inventoried and reported with DOE approved procedures.
- Provide effective support for on-site Counter Intelligence (CI) activities.

TARGET: Maintain an effective Security Program in accordance with all applicable requirements. Maintain effective professional relations with threat reduction officials at DOE Headquarters, FBI Norfolk, and Newport News Police Department by participating in opportunities to share information in security, community policing, and incident management. Effectively perform functions specified in Site Specific CI Support Plan.

Note: Jefferson Lab may be given additional credit (points) for exceptional performance in areas outside the adjectival rating resulting from the committee's assessment (i.e., system enhancements, improvements in procedures practices, implementation of new program, etc.).

JSA Performance:

JSA registered with the Bureau of Political-Military Affairs, the Directorate of Defense Trade Controls, the Office of Defense Trade Compliance, and the U. S. Department of State and was approved by IdenTrust (IDT) to enable JLab to submit license requests electronically. The registration establishes a foundation to set up an Export Control review and approval process with the TJSO and the Office of Naval Research. This will enable the Lab to request a deemed export license for select foreign nationals working with sensitive export controlled technology within Defense related programs. Both Kris Burrows and Shauna Cannella have been designated by the Lab Director to administer the program with the DoS/DDTC.

JLab kept the TJSO Site Manager and the Office of Naval Research Program Manager informed of efforts to obtain an appropriate export license for a highly qualified foreign national Lab employee in support of the 100 kW class FEL Experimental Device. In addition, the Lab also coordinated the development of a multi-agency nondisclosure agreement to meet the needs of the interested parties.

TJSO officials were advised on T-5 national processing gaps between DOE HQ elements. JLab tracked assignment packages, responded immediately to Dr. Orbach's request for administrative changes, and tracked through to Under Secretary approval. The Lab also developed and implemented controlled area facility procedures and physical security countermeasures to protect security interests in the FEL Controlled Area and methods to verify U.S. Citizenship and U.S. Persons.

TJSO officials were advised about in processing gaps in the administration of HQ DOE Annual Security Awareness Training for JLab employees who possess security clearances and serve on the HQ DOE HQ Office of Science Security and Safeguards Advisor Committee. In addition, the Lab continues to provide support to the FBI Norfolk and DOE Washington Regional Counterintelligence Office in exchange of information, interviews of international travelers, and issues of mutual interest. TJSO's Site Manager was informed of all sensitive topics.

Additional activities during this performance period include completing Revision 2 of the Lab's Nuclear Materials Control & Accountability Plan in accordance with guidance in the Office of Science Management System (CAMS). Facilities Management also completed change 3 to the Lab's Site Security Plan and completed the biennial physical inventory to record reportable quantities of Deuterium gas and radiological sealed source quantities of Americium-241.

Facilities Management security staff completed the DOE Facility Security Officer's Orientation Course (PHY-210DB) that was offered by the DOE National Training Center. In addition, Kris Burrows, the Lab's Facility Security Officer (FSO) attended the INFRAGARD and American Society of Industrial Security meeting with representatives of the FBI Norfolk Field Intelligence Group (FIG). He also attended the Nuclear Security Information Exchange meeting of DOE contractor security directors; the DOE Security Directors Meeting; and the DOE Office of Science Security Working Group at the Nevada Site Office June 23 – 26, 2008. TJSO's Security Program Manager was briefed on all significant personnel changes and issues within the DOE SC security management office.

On September 22 – 24, 2008 the JLab Counterintelligence Representative facilitated discreet meetings between senior laboratory and DOE Site Office management, DOE Regional Counterintelligence, and FBI Norfolk. Effective coordination between agencies resulted in the FBI performing a safe felony arrest

of a local businessman, discreet execution of a Federal search warrant in an adjacent office building suite, and controlled release of information to Public Affairs, DOE HQ, and the local press.

Measure 8.3.2 Requirement: Demonstrate effective Security Program through internal, self-assessment and external reviews, surveys and inspections.

TARGET: Conduct and document a self-assessment of all applicable aspects of the Security Program and submit to TJSO 6-months prior to the next Security Survey.

JSA Performance:

JLab received approval from the TJSO to use the results of the Security Self Assessment dated January 2, 2007, the Security Risk Assessment dated April 12, 2007 and the JSA Contract Requirements Definition Report dated August 10, 2007 to satisfy the requirement to conduct a Security Self Assessment between biannual security surveys. The results of these surveys were used to update JLab plans, policies, and procedures in preparation for the Security Survey by ORO that was originally scheduled to be held June 2008. The survey was deferred to August 2008 due to preparations for the HSS Review.

The Security and Services staff hosted the 2008 DOE Security Survey August 19-21, 2008. George Blanchard, Oak Ridge Office and Dave Sanborn, Legacy/Critique evaluated 31 areas of JLab's Security Program Management and Support, Physical Security, Personnel Security, Unclassified Visits and Assignments by Foreign Nationals, and Nuclear Materials Control and Accountability. JLab received a Satisfactory rating – the highest possible rating with favorable comments in security training. On September 24, 2008 a Corrective Action Plan involving Unclassified Foreign Visits and Assignments was submitted to TJSO one week ahead of the due date.

The Annual Security Awareness briefing was updated to include FEL Controlled Area requirements, non-U.S. person restrictions, a clear outline of duties of protective personnel, and vehicles as well as hand-carried item inspection requirements. Physical security facilities and procedures were also developed for the FEL Controlled Area that will enable sensitive export controlled science & technology to be worked within the facility under appropriate open storage conditions.

Objective 8.4 Provide an Efficient and Effective System for the Protection of Classified and Sensitive Information

Measure 8.4.1 Requirement: Effectively operate a sensitive information system for the Laboratory's Business Sensitive and Personnel Sensitive information

TARGET: Meet existing and new requirements for management of sensitive information on an appropriation budget schedule, as applicable to JLab; and favorable results on internal/external reviews, surveys and inspections that demonstrate the protection of classified and sensitive information program is: effective, integrated into laboratory culture, and laboratory leadership's commitment to strong cyber security performance.

Note: Jefferson Lab may be given additional credit (points) for exceptional performance in areas outside the adjectival rating resulting from the committee's assessment (i.e., system enhancements, improvements in procedures practices, implementation of new program, etc.).

JSA Performance:

In November and December the FEL staff that have access to sensitive information were provided supplemental security training and provided a secure workspace near the FEL plus two lockable offices in

CEBAF Center. Their shared sensitive files were moved to a secure area on the file server with restricted access. A separate FEL VLAN was set up with additional network boundary controls for the purpose of restricting accessing to and working with FEL sensitive information.

New procedures were put in place with DAA approval for transferring sensitive RADCON information from the Lab to DOE. RADCON staff with access to sensitive information were issued 2-factor authentication technologies for accessing computers with access to sensitive information. The Access Control List for the Web Server Network was updated so no outbound traffic is allowed, and the IT Division identified and moved approximately 100 desktops to managed desktop network segments. While not directly effecting the Business-Admin, Core or FEL enclaves, this was part of the Lab's defense in depth strategy for layers of protection that enhance the protection of the more sensitive networks.

JLab was congratulated by the Under Secretary for Science, Ray Orbach, for receiving approval from the TJSO for full Authority to Operate (ATO). The ATO was received after implementing several cyber enhancements in FY07 and improving the overall cyber security posture of JLab. The Lab continued to make cyber security enhancements in FY08 and have had key enhancements formally tracked by DOE as POA&Ms and included in PEMP measure 8.2.4. The status of these POA&Ms was reported quarterly to DOE along with the Lab's quarterly Cyber Security Report Card.

JLab's IT Division developed an implementation plan and completed a Position Categorization System to ensure that individuals involved in handling sensitive information are appropriately screened and trained. JLab also added new signatures to the intrusion detection systems used within networks containing sensitive information, completed physical security upgrades in the Data Centers and completed an annual Threat and Risk Assessment.

TJSO Mid-Year Feedback → Despite the strained budget environment, the Lab has performed very well in maintaining its security posture and its ability to respond to crucial data calls (100% on-time submissions). The ATO (Authority to Operate) designation which was granted this FY, was a highly visible process, and is a strong indication of the overall effectiveness of the program.

Opportunity for Improvement:

- TJSO 3rd Quarter Feedback → *While progress has been stated regarding Position categorization, the Site Office has not seen any documentation that has led up to the current implementation status.*

Status: The POA&M to Implement a Position Categorization System was completed on August 1, 2008. A process for position categorization was defined, an outside vendor was chosen for screening potential employees that will be handling sensitive information, and training has been created and added to the Skills and Requirements List (SRL) of employees handling sensitive information. Documentation on the state of the Lab's Position Categorization System will be provided to the Site Office during the first quarter of FY09.

Table 35. Goal 8.0 Performance Rating Development

ELEMENT	Letter Grade	Numerical Score	Objective Weight	Total Points	Total Points
8.0 Sustain and Enhance the Effectiveness of Integrated Safeguards and Security Management (ISSM)					
8.1 Provide an Efficient and Effective Emergency Management System	B+	3.2	30%	0.96	
8.2 Provide an Efficient and Effective System for Cyber-Security	A	3.8	50%	1.90	
8.3 Provide an Efficient and Effective System for the Protection of Special Nuclear Materials, Classified Matter, and Property	A-	3.5	10%	0.35	
8.4 Provide an Efficient and Effective System for the Protection of Classified and Sensitive Information	A-	3.7	10%	0.37	
Performance Goal 8.0 Total					3.58

Table 36. Goal 8.0 Final Letter Grade

Total Score	4.3-4.1	4.0-3.8	3.7-3.5	3.4-3.1	3.0-2.8	2.7-2.5	2.4-2.1	2.0-1.8	1.7-1.1	1.0-0.8	0.7-0
Final Grade	A+	A	A-	B+	B	B-	C+	C	C-	D	F